A POCKETBOOK OF E-BUSINESS INDICATORS

2006 EDITION

A portrait of
e-business in 10 sectors
of the EU economy

2006 edition

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European Commission

The European e-Business
Market W@tch

The European e-Business Market W@tch 2006

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A great deal of additional information on the European Union is available on the Internet. It can be accessed through the Europa server (http://europa.eu).

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The European *e-Business W@tch*

A European e-Business Observatory since 2002

The deployment of information and communication technologies (ICT) is changing the way in which companies trade with their suppliers and customers. *e-Business W@tch* monitors related developments and analyses the impact on different sectors of the European economy. Special emphasis is placed on the implications for small and medium-sized enterprises (SMEs).

The initiative was launched by the European Commission, DG Enterprise and Industry, in late 2001. It will be operational at least until January 2007; a follow-up initiative is currently in preparation.

In 2006, studies by *e-Business W@tch* covered 10 sectors, including manufacturing industries, construction, tourism, telecommunications and the hospital sector. A cornerstone of the monitoring activities is a representative survey among decision- makers in European enterprises about their use of ICT and e-business. This pocketbook presents the results of the e-Business Survey 2006; fieldwork was conducted in March and April.

All publications of *e-Business W@tch*, including this booklet, sector study reports and case studies, are available in electronic format at:

www.ebusiness-watch.org
or via the Europa server
(http://ec.europa.eu/comm/enterprise/ict/policy/watch/index.htm).

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Sector studies and special reports in 2006

In late 2006, *e-Business W@tch* will publish the following studies. All documents will be available for free download (in *.pdf format) from the website

(www.ebusiness-watch.org).

e-Business Sector Studies

- Food & beverages
- Footwear
- Pulp and paper
- ICT manufacturing
- Consumer electronics
- Shipbuilding and repair
- Construction
- Tourism
- Telecommunications
- Hospital services

Special Reports

- ICT Impact on Corporate Performance, Productivity and Employment Dynamics
- The Role of New Companies in e-Business Innovation and Diffusion

Synthesis Reports

- European e-Business Report – 2006
- Pocketbook of e-Business Indicators – 2006
- Brochure: e-Business in Europe – 2006

Electronic Business in the EU in 2006

Sectoral Differences in e-Business Adoption

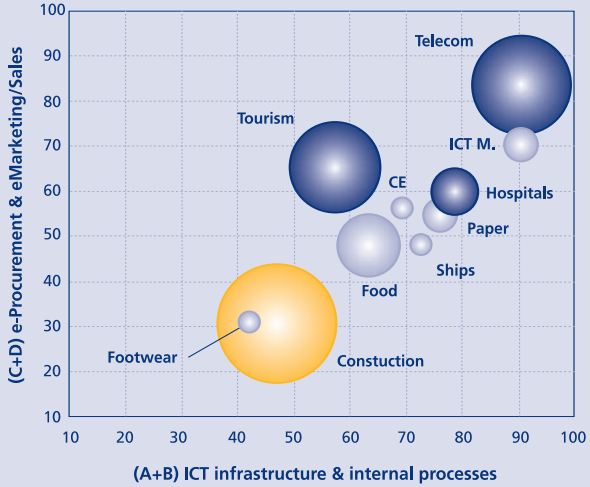
The nature and impact of electronic business differs widely between sectors, particularly between manufacturing and service sectors. Furthermore, the nature of e-business activities depends on whether the focus is on business-to-business (B2B) or business-to-consumer (B2C).

ICT related industries

ICT industries (ICT manufacturing, telecommunications) not only provide the equipment and services which other industries need for their e-business. They also make intensive use of these technologies as part of their own business processes. Both in supply-side and customer facing e-business activities they are forerunners.

The telecommunications industry in particular sets standards for the use of ICT in marketing, sales and customer care. Even small telecommunications companies use e-business tools for this purpose in a way that could serve as role model for activities by their counterparts in other industries.

e-Business Scoreboard 2006 (for sectors, EU-10)



The Scoreboard consists of 16 component indicators, grouped in four categories (see p. 79). In this presentation, the x-axis comprises the categories A and B, and the y-axis the categories C and D. The underlying survey data have been weighted by employment, thus emphasizing the activity of larger firms. The size of the bubbles is indicative for the relative size of a sector (by employment). Data for hospitals are not 100% comparable, as for some business indicators proxies had to be used.

Alignment among manufacturing industries

Among many of the non-ICT manufacturing industries, the pattern of sectoral e-business evolution has been similar. Large companies drive the development, with supply-chain integration as a key objective. The 'digital divide' between the large players and the small companies is very pronounced in these industries. Examples from the sectors studied in 2006 are the food & beverages, the pulp & paper and the shipbuilding industry.

In the footwear industry, ICT and e-business are generally used much less than in the other manufacturing industries. The sector is dominated by mostly small craft and trade companies, most of whom do not see ICT as a useful instrument to enhance their business.

ICT trends in construction

To some extent, this also applies to many of the small companies in the construction industry; however, results for this sector have to be interpreted with caution. The survey questionnaire was mainly adapted to ICT use in manufacturing industries and, possibly does not fully reflect some emerging trends in construction. Technologies such as project web and 3D visualisation tools carry significant economic potential for the industry (see p. 58).

Tourism

e-Tourism has evolved dynamically over the past 5 years. A major impact is that ICT enables service providers to interact directly with customers, which puts enormous pressure on traditional intermediaries such as travel agencies and tour operators. The extent to which intermediaries are bypassed differs considerably between sub-sectors. The accommodation sector, for example, is only partially affected by dis-intermediation; specific branches of the transport sector, however, tend to be strongly affected.

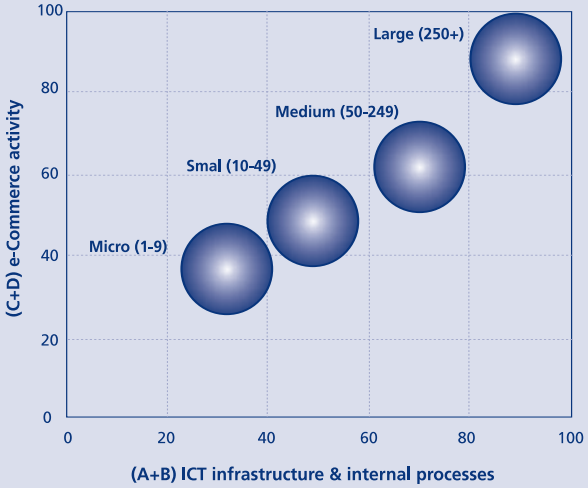
Hospitals

Almost all European hospitals surveyed have at least an electronic system for patient data and financial administration. However, only few of them use more sophisticated systems, and departmental information systems are often not integrated with each other. Important drivers of e-business implementation are cost containment, improvement of the quality of health care, and state regulations. Barriers to ICT investment include management deficiencies, a lack of interoperable and widely used standards, and security challenges.

e-Business and SMEs

Results of the previous e-Business Survey (2005) pointed at a pronounced gap in e-business adoption between the small firms (with up to 49 employees) and the medium-sized ones (50-249 employees). For the 10 sectors studied in 2006, the picture appears to be slightly different – it shows large firms clearly leading the way (see exhibit). The difference has to do with the selection of sectors on which the benchmarking is based, and on the choice of component indicators.

e-Business Scoreboard 2006 (for size-bands, EU-10)



For more information about the Scoreboard, see p. 45 and p. 79. The component indicators for size-bands are based on aggregated data from the 10 sectors studied in 2006 (in 10 EU countries).

From this evidence it could be concluded that ICT tends to increase existing economies of scale, as large firms can afford more powerful ICT systems at proportionally lower cost than SMEs.

However, it is debatable whether small companies really need the same powerful solutions as large firms in order to derive an equivalent benefit. SMEs have profited enormously from the internet, for example, simply by getting access to market information at low cost. This has decreased the competitive disadvantage they used to suffer against larger companies.

Furthermore, recent activities of the large software providers are increasingly focused on the SME clientele; they develop new and flexible solutions adapted to the needs of smaller companies. This could enhance ICT adoption among these firms.

Summary

Geographic Differences in e-Business

In international comparisons, EU enterprises are (on average) level with their counterparts in other advanced economies in their use of ICT. Within Europe, gaps still exist between regions that are technologically more and less advanced - with the differences more pronounced for smaller companies.

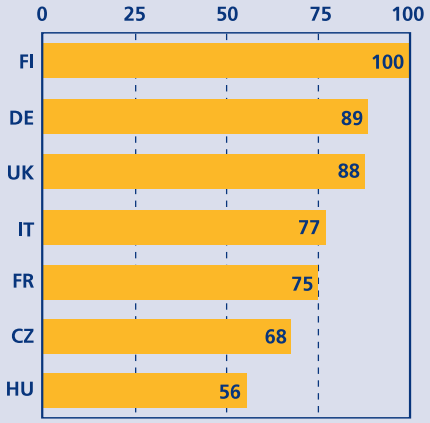
In general, firms in Northern European countries tend to be more inclined towards ICT and e-business than their Southern European counterparts. For example, survey results for companies from Finland, Sweden, Denmark and Norway point at a highly networked economy (intensive ICT links between businesses) in those countries.

e-Business Index 2006

(for selected countries, based on 10 sectors)

Based on data in % of firms, thus emphasizing small companies).

The index aggregates 16 component indicators (see p. 79).



Challenges for country comparisons

However, as previous editions have already warned, the location of a company is by no means a reliable predictor for the level of its e-business activity. This is due to structural characteristics and measurement challenges:

- Comparisons partly reflect industry structure. In countries where small firms or low-tech sectors are more prevalent than in others, data will also point at a comparatively lower level of e-business activity.
- The sector configuration in the 2006 survey differed considerably between countries (in terms of the number of interviews that could be accomplished in a given sector). Thus, data are not 100% comparable between countries.

ICT Impact

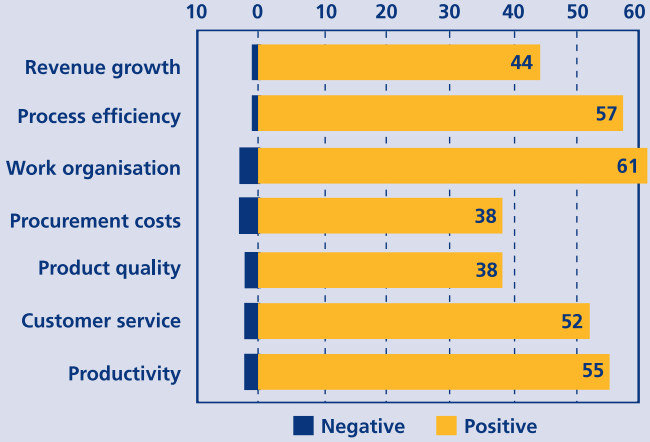
Economic research has confirmed the impact of ICT on firms' productivity. A common observation in this context is that this effect has been larger among US enterprises over the past 10-15 years than in European enterprises. This has been a major concern of EU policy for years.

In 2006, *e-Business W@tch* asked companies to assess the impact of ICT on their own business. The "efficiency of business processes" and "work organisation" are those areas where most companies have experienced positive effects (see exhibit). This confirms, once again, that ICT is a key instrument to optimise linkages in the internal value chain and between enterprises. As a result, 55% of the firms interviewed report positive productivity effects.

Customer service is another area where many companies (52%) observe positive effects from ICT; in telecommunications, the figure rises by as much as 75%. Interestingly, even in manufacturing sectors, more companies report positive ICT effects on customer service than on reducing procurement costs.

Only a minority of a few % report (or admit) negative effects in any of the business areas surveyed. The remainder have not observed any effect from ICT, or are undecided.

Perceived ICT impact on the business



Read: "Firms representing …% of employment in the sectors surveyed observe a positive/negative impact of ICT on revenue growth/process efficiency/ …"

Base: EU-10, 10 sectors. N = 7237.

ICT as a key enabler of process innovation

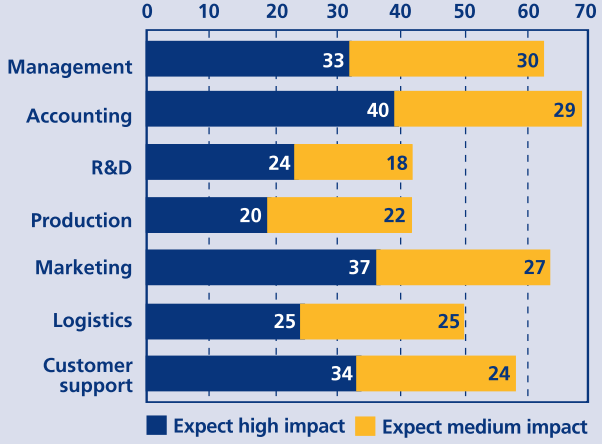
Survey results confirm that ICT continues to be a key enabler and driver of process innovation in most industries. 32% of firms (by employment) reported in the survey that they had introduced "new or significantly improved internal processes" in the 12 months prior to the interview. Of these, 75% said that these process innovations were "directly related to or enabled by ICT". In services (telecommunications, tourism, hospitals), about 80-90% of process innovations are ICT-enabled.

Anticipated ICT impact in the future

Companies expect that ICT will have a "high impact" in the future particularly for management and accounting, as well as for marketing and customer service (see exhibit).

The anticipated impact depends, of course, on the industry and the size of a company. For example, ICT effects on production processes will be more significant for manufacturing companies. In fact, firms representing about 60% of the pulp and paper industry, ICT manufacturing and shipbuilding expect a high or medium impact on production, compared to about 40% in construction or tourism. The same applies to effects on logistics.

Where ICT will have an impact in the future



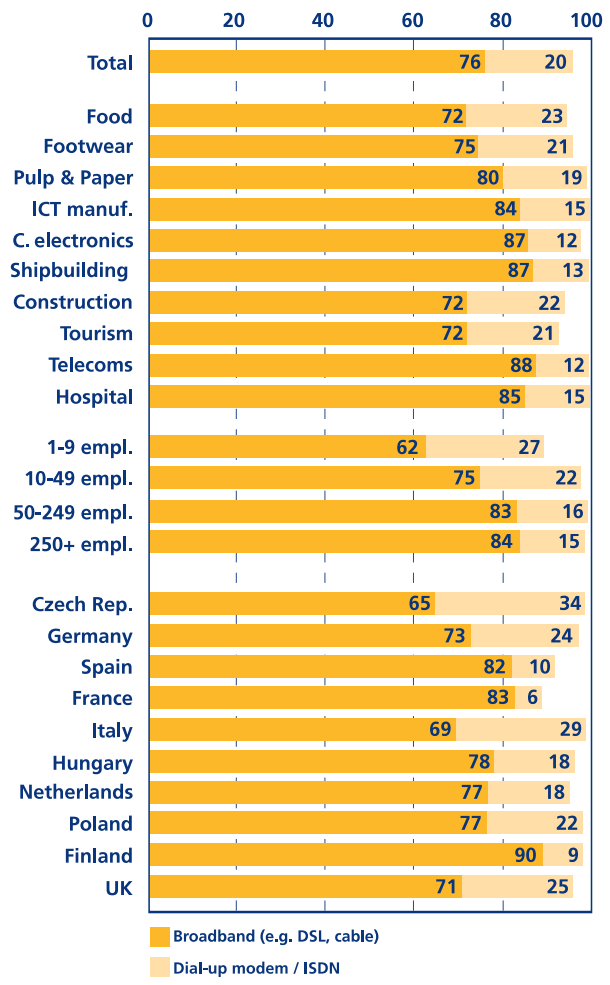
Read: "Firms representing …% of employment in the sectors surveyed expect that ICT will have a high/medium impact on management/ accounting/ … in the future." Base: EU-10, 10 sectors. N = 7237.

30 Indicators on Electronic Business - Overview

A	**Use of ICT networks**
A-1	Internet access
A-2	Wireless LAN
A-3	Voice-over-IP
A-4	Remote access
B	**Internal e-Integration**
B-1	Intranet
B-2	ERP (Enterprise Resource Planning) systems
B-3	Companies tracking working hours online
B-4	Companies sending or receiving e-invoices
C	**e-Procurement and Supply Chain Integration**
C-1	Companies placing orders to suppliers online
C-2	Use of specific ICT solutions to support sourcing and procurement processes
C-3	Companies linking their ICT system with suppliers
C-4	SCM (Supply Chain Management) systems
D	**e-Marketing and Sales**
D-1	CRM (Customer Relationship Management) systems
D-2	Companies accepting orders from customers online
D-3	Use of specific ICT solutions to support marketing and sales processes
D-4	Companies linking their ICT system with customers
E	**e-Standards and Interoperability**
E-1	Use of e-standards
E-2	Use of Open Source operating systems
E-3	Use of Open Source databases
E-4	Perceived importance of interoperability
F	**ICT Skills and Outsourcing**
F-1	Regular ICT training of employees
F-2	Outsourcing of ICT services in 2005
G	**ICT Security**
G-1	Use of Secure Server technology
G-2	Use of Digital Signature / PKI
H	ICT and Innovation
H-1	Product and service innovation
H-2	Process innovation
I	**ICT Impact**
I-1	ICT impact on competition
I-2	ICT impact on revenue growth
I-3	ICT impact on business process efficiency
I-4	ICT impact on quality of customer service

e-Business Indicators 2006:
A. ICT Networks

A.1: Internet access



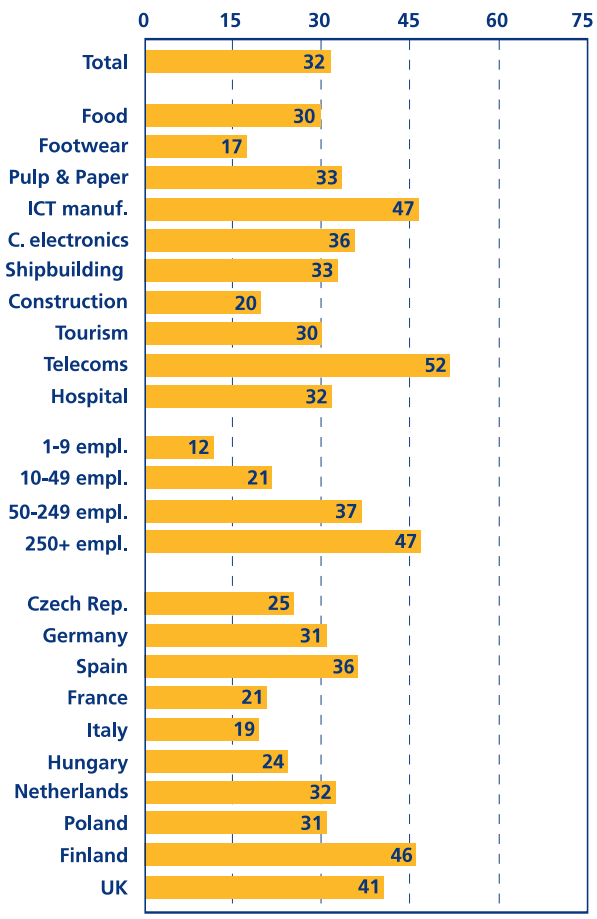
Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country).
Figures for size-bands in % of enterprises from the size-band.

Survey questions: "A1: Does your company / hospital have access to the internet?" A3: "Which technology does your company / hospital use to connect to the internet?"

Source: *e-Business W@tch* (Survey 2006)

A.2: Wireless Local Area Network (W-LAN)



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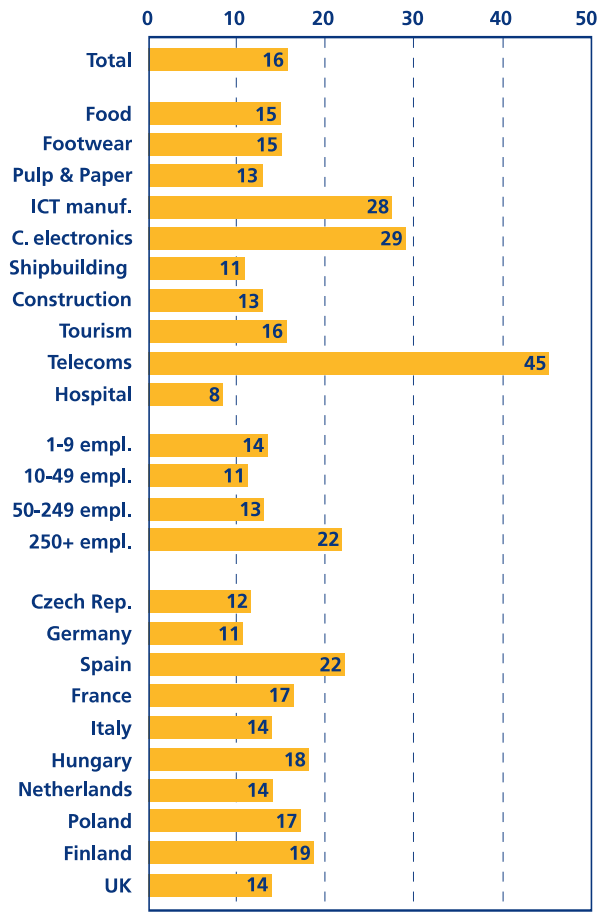
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country).
Figures for size-bands in % of enterprises from the size-band.

Survey question: A4b: "Does your company /hospital use a Wireless LAN?"

Source: *e-Business W@tch* (Survey 2006)

A.3: Use of Voice-over-IP



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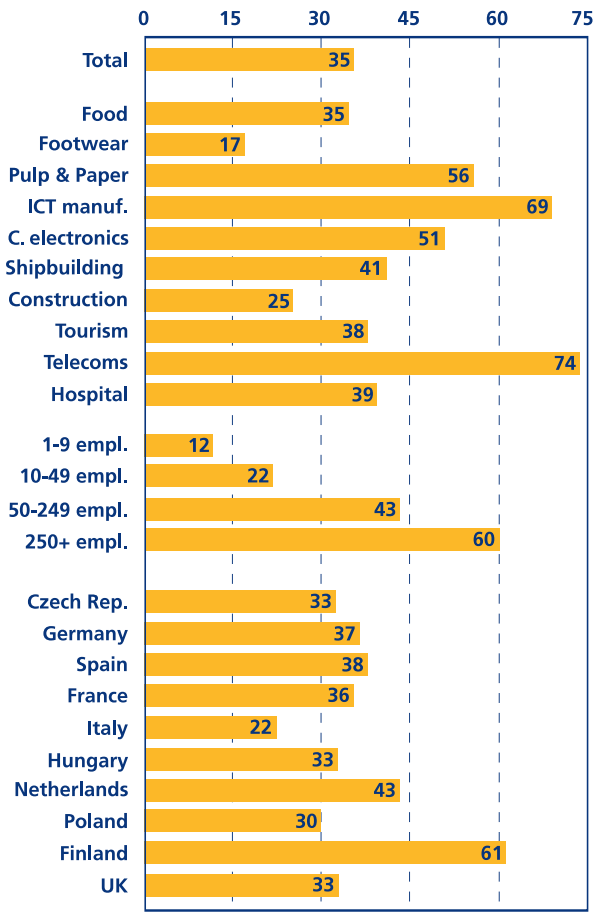
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country).
Figures for size-bands in % of enterprises from the size-band.

Survey question: A4c: "Does your company / hospital use Voice-over-IP, that is telephony based on internet protocol?"

Source: *e-Business W@tch* (Survey 2006)

e-Business Indicators 2006:
A. ICT Networks

A.4: Remote access



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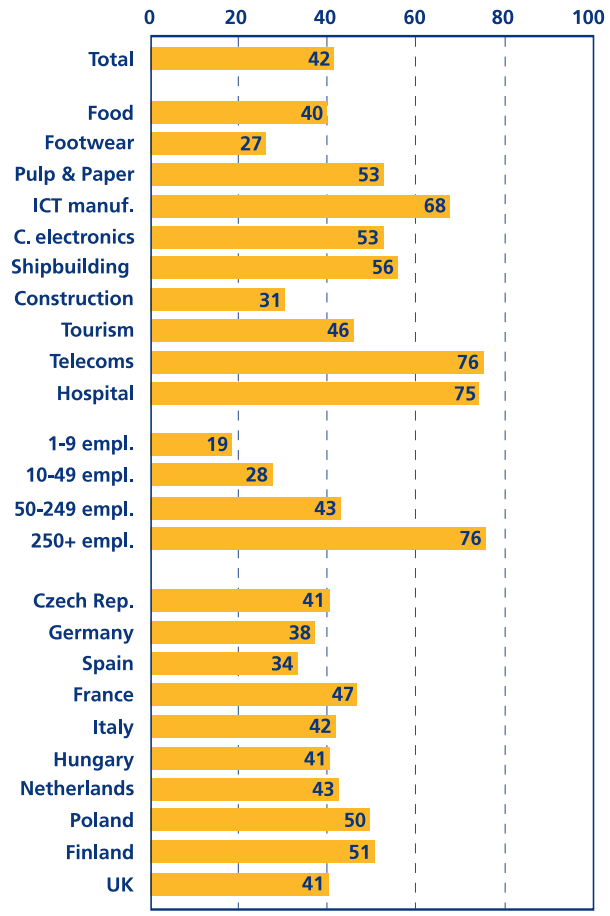
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country).
Figures for size-bands in % of enterprises from the size-band.

Survey question: A5: "Can employees of your company / hospital access your computer system remotely from outside the company / hospital, for instance from home, from a hotel or while travelling?"

Source: *e-Business W@tch* (Survey 2006)

B.1: Companies using an intranet



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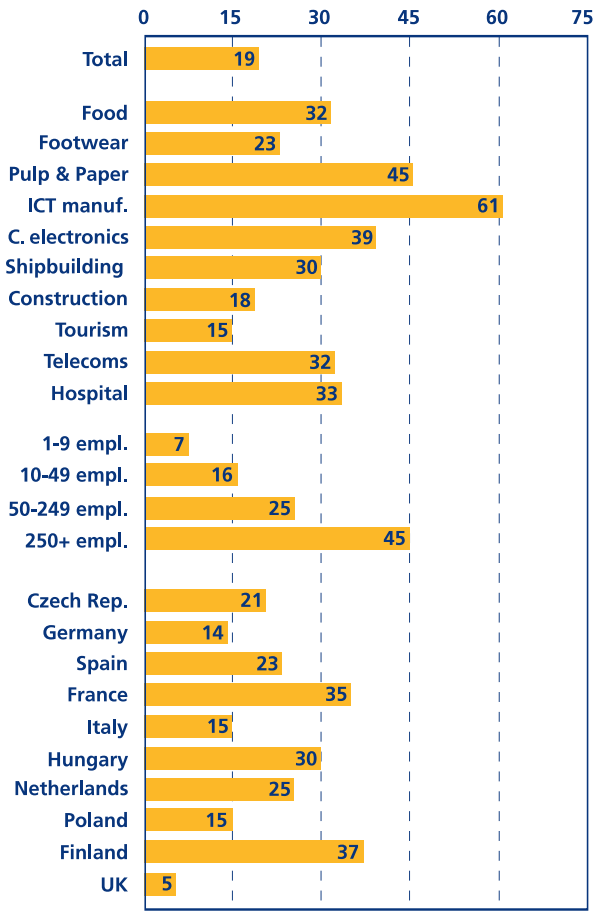
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: D1a: "Does your company / hospital use … an intranet?"

Source: *e-Business W@tch* (Survey 2006)

B.2: Companies using an ERP system



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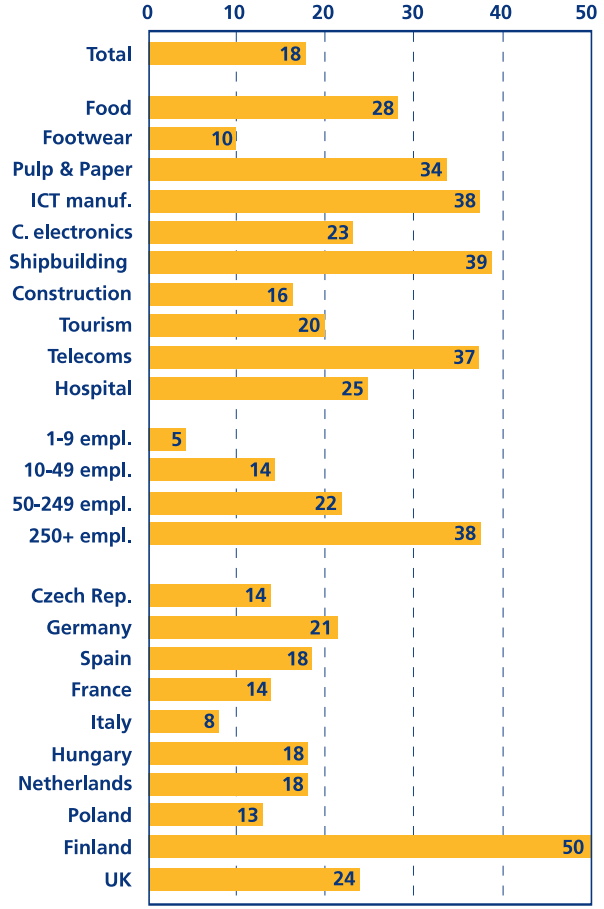
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey questions: D1d: "Does your company / hospital use … an ERP system, that is Enterprise Resource Planning System?"

Source: *e-Business W@tch* (Survey 2006)

B.3: Companies tracking working hours and/or production time online



Base: Enterprises with internet access from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7009 (total).

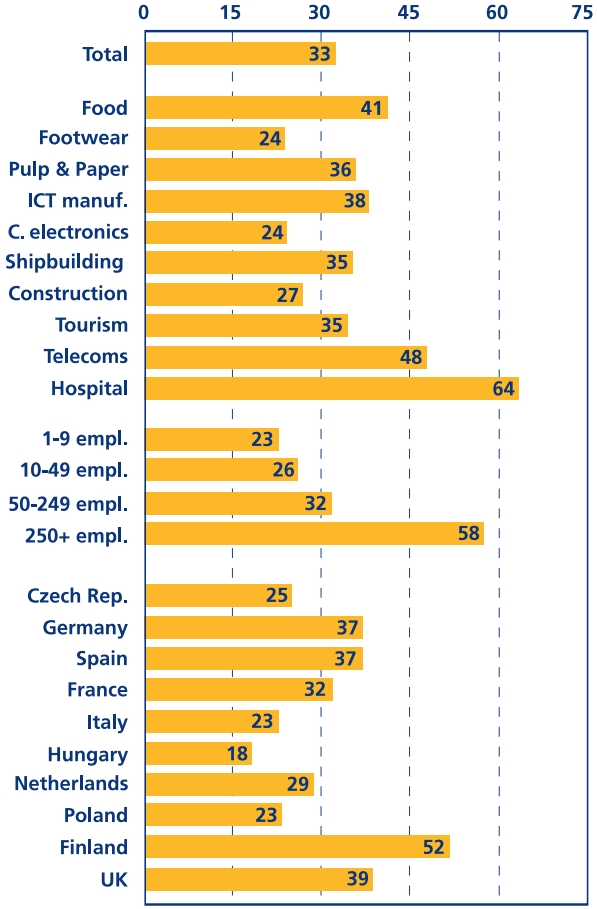
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey questions: D5c: "Does your company / hospital use online applications other than e-mail, for example special software to track working hours or production time?"

Source: *e-Business W@tch* (Survey 2006)

e-Business Indicators 2006:
B. Internal e-Integration

B.4: Companies sending and/or receiving e-invoices



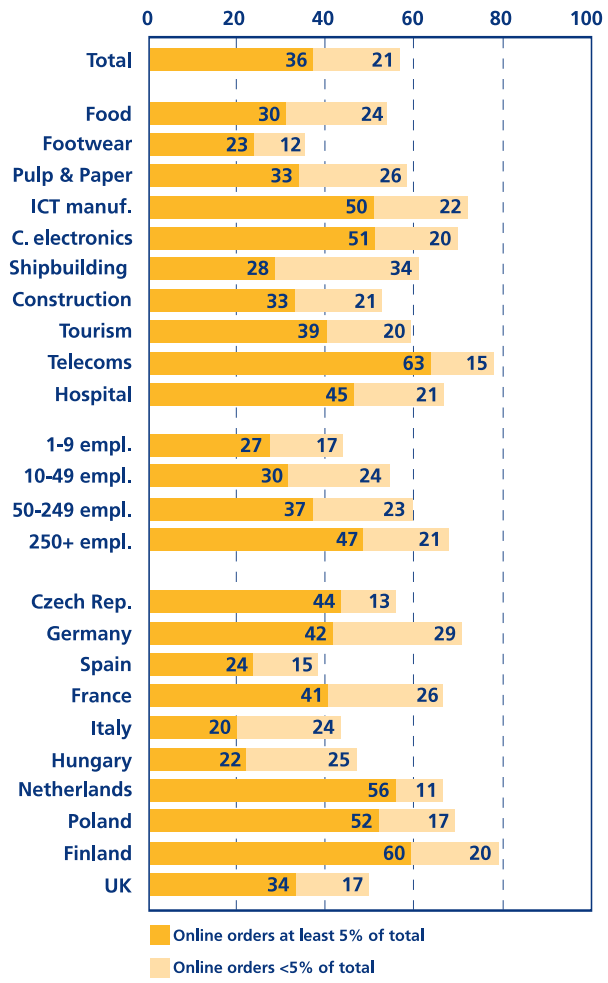
Base: Enterprises with internet access from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7009 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey questions: D5f-h: "Does your company / hospital use online applications other than e-mail … to send e-invoices to customers in the public sector / in the private sector / to receive e-invoices from suppliers?" (percentage of companies answering "yes" to at least one of the three questions)

Source: *e-Business W@tch* (Survey 2006)

C.1: Companies placing orders to suppliers online



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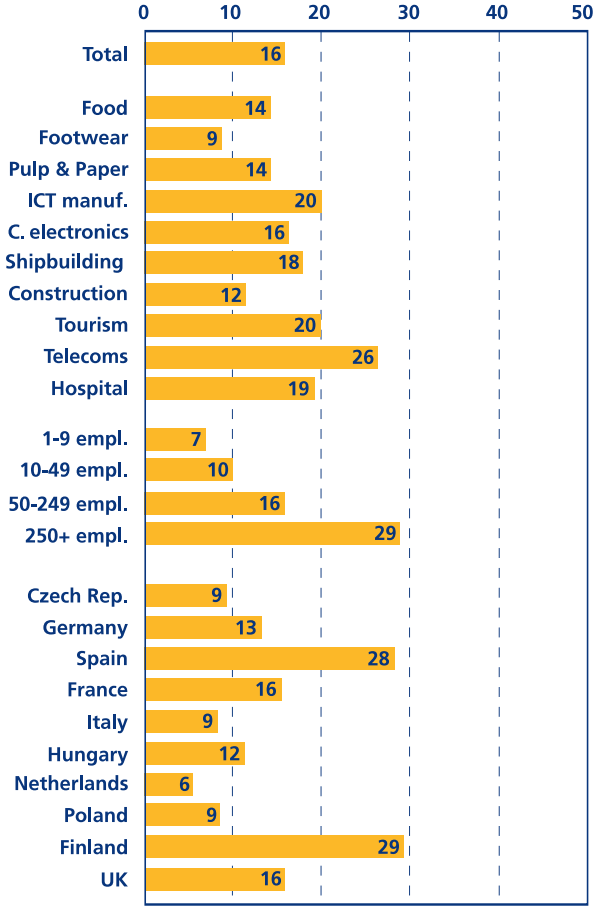
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: E1: "Does your company / hospital use the internet or other computer-mediated networks to place orders for goods or services online?"

Source: *e-Business W@tch* (Survey 2006)

C.2: Companies using specific ICT solutions to support sourcing and procurement processes



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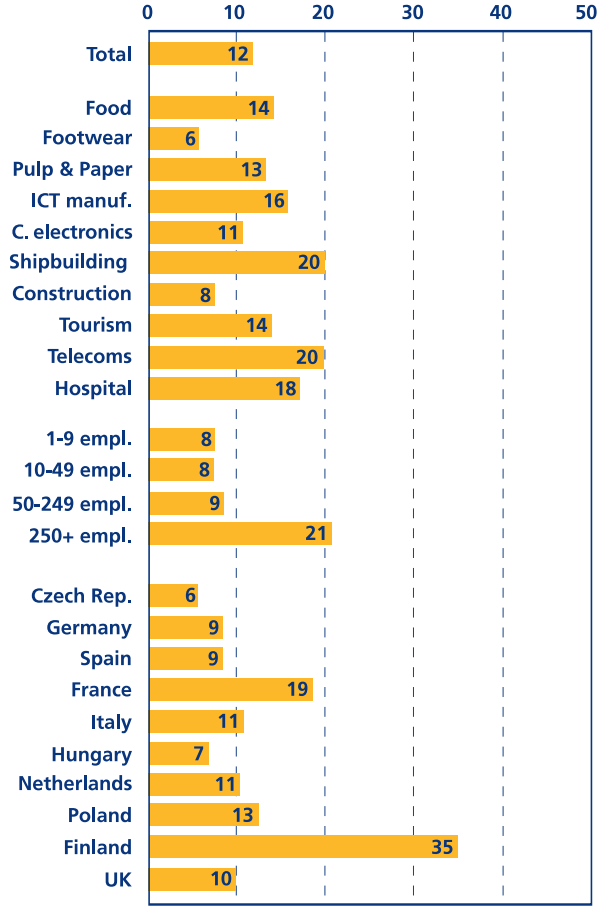
Weighting: Total number, sectors, countries are weighted by employment = enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: E7: "Does your company / hospital currently support the selection of suppliers or procurement processes by using specific IT solutions? By IT solutions we do NOT mean Word, Excel, plain-text e-mail or search engines …, but rather specific software solutions or internet-based services."

Source: *e-Business W@tch* (Survey 2006)

C.3: Companies whose ICT system is linked with those of suppliers



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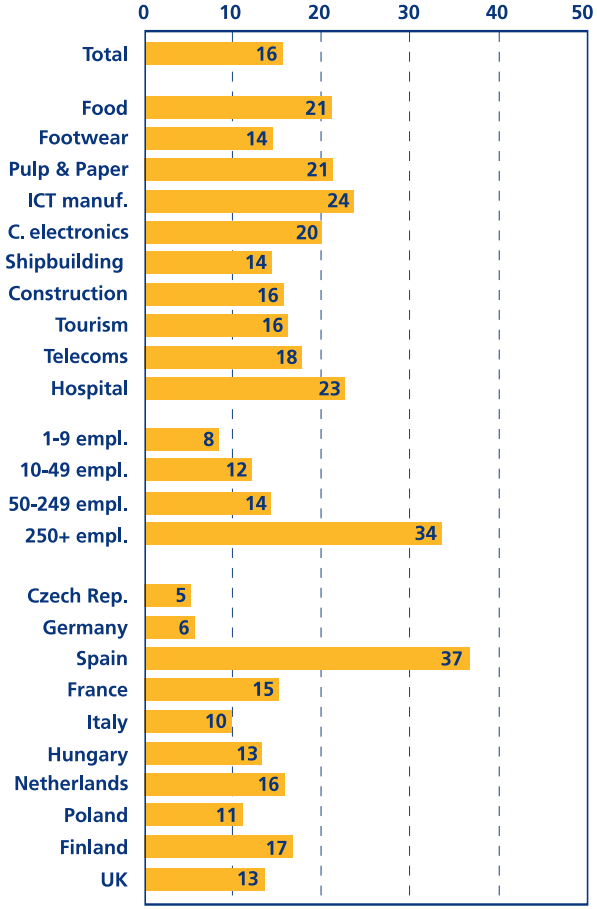
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: F13a: "Is your company's / hospital's ICT system linked to the ICT system of suppliers?"

Source: *e-Business W@tch* (Survey 2006)

C.4: Companies using a Supply Chain Management (SCM) system



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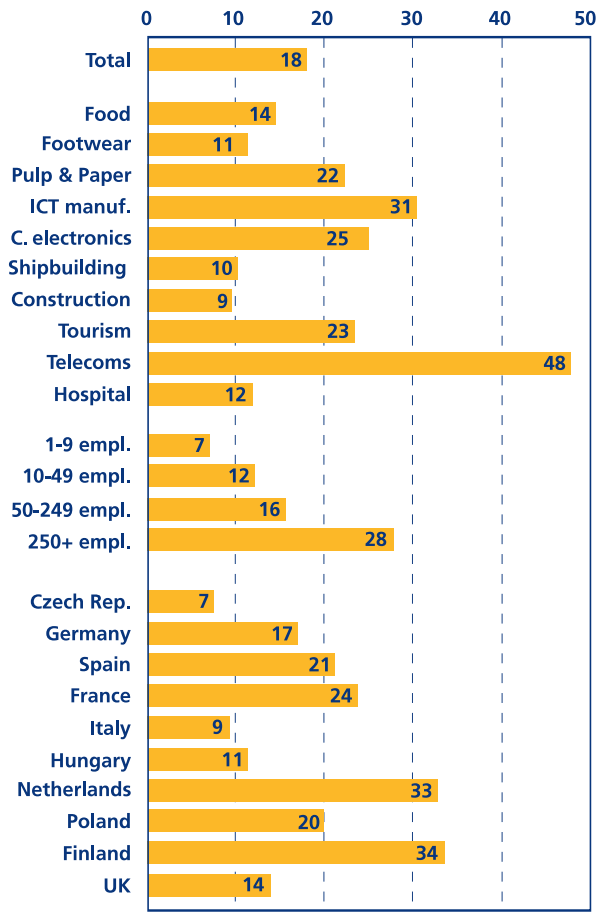
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: D1f: "Does your company / hospital use an SCM system, that is a Supply Chain Management System?"

Source: *e-Business W@tch* (Survey 2006)

D.1: Companies using a CRM system



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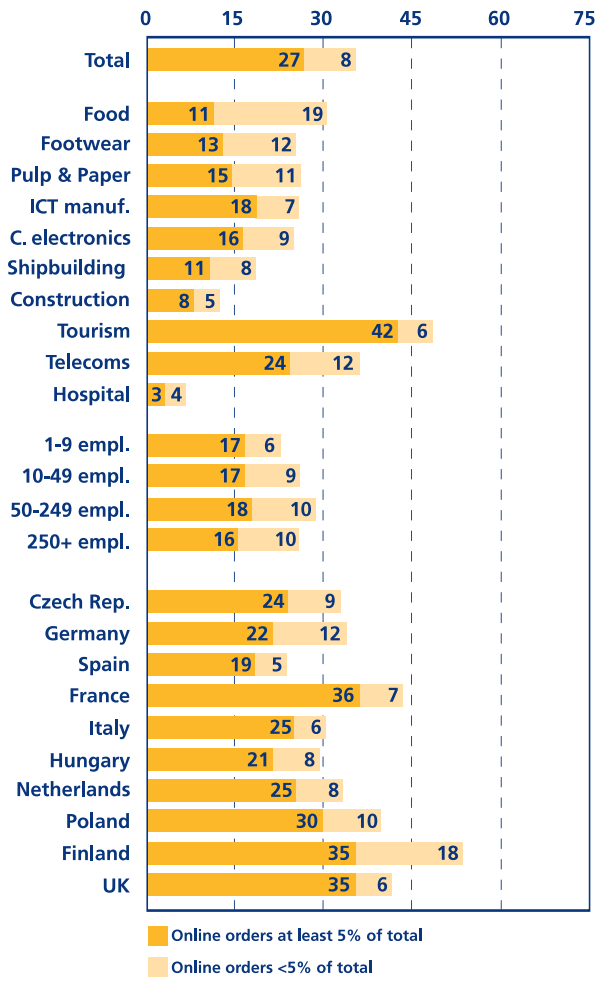
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country).
Figures for size-bands in % of enterprises from the size-band.

Survey question: F2: "Does your company / hospital use a CRM system, that is a specific software suite for customer relationship management?"

Source: *e-Business W@tch* (Survey 2006)

D.2: Companies accepting orders from customers online



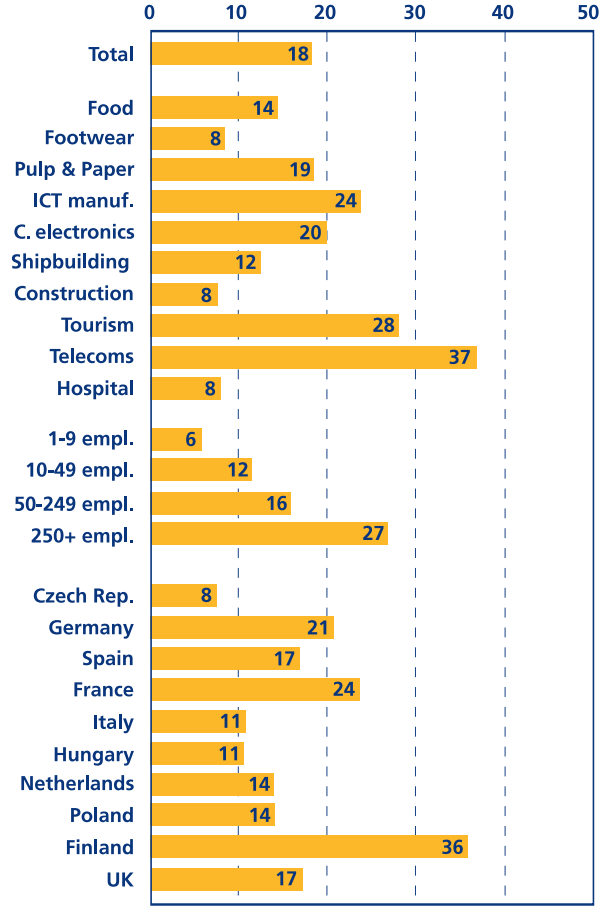
Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country).
Figures for size-bands in % of enterprises from the size-band.

Survey question: F4: "Does your company / hospital allow customers to order goods or book services online from the website or through other computer-mediated networks?"

Source: *e-Business W@tch* (Survey 2006)

D.3: Companies using specific ICT solutions to support marketing or sales processes



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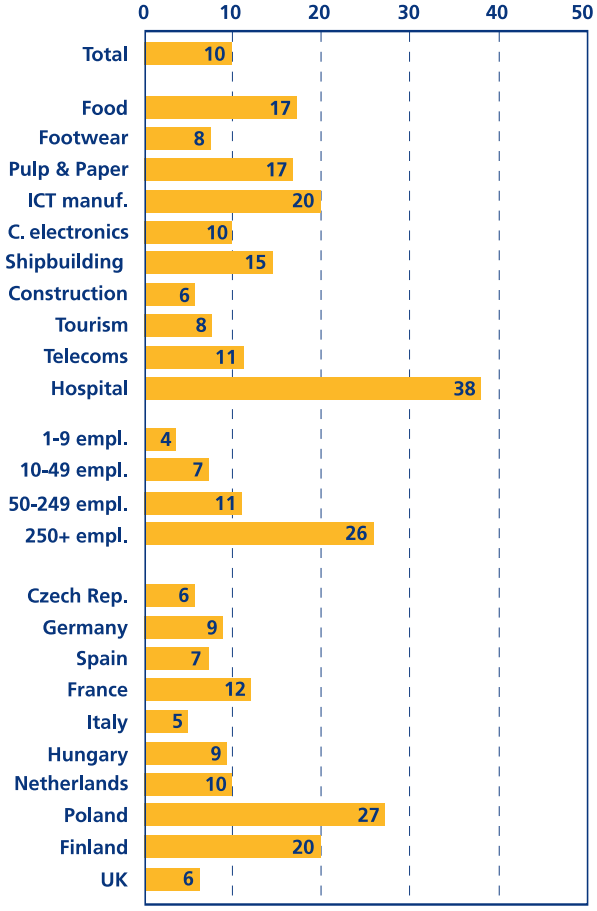
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: F10: "Does your company / hospital support marketing or sales processes by using specific IT solutions? By IT solutions we do not mean Word, Excel, plain-text e-mail or search engines …, but rather specific software solutions or Internet-based services."

Source: e-Business W@tch (Survey 2006)

e-Business Indicators 2006:
D. e-Marketing and Sales

D.4: Companies whose ICT system is linked with those of customers



Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: F13b: "Is your company's / hospital's ICT system linked to the ICT system of customers?"

Source: *e-Business W@tch* (Survey 2006)

e-Business Indicators 2006:
E. Standards and Interoperability

E.1: Use of e-standards

	Use EDI-based standards	Use XML-based standards	Use proprietary standards	Use other standards
Total	**9**	**11**	**19**	**4**
Food	31	8	20	4
Footwear	7	6	18	2
Pulp & paper	20	15	19	2
ICT manuf.	21	16	26	6
C. electronics	8	11	23	6
Shipbuilding	6	15	21	6
Construction	3	8	15	2
Tourism	7	15	20	3
Telecommunications	13	29	37	6
Hospitals	23	28	32	6
1-9 empl.	2	6	10	1
10-49 empl.	4	5	13	2
50-249 empl.	10	10	24	2
250+ empl.	29	27	31	7
Czech Republic	7	9	14	3
Germany	15	9	21	3
Spain	5	14	18	2
France	9	10	26	2
Italy	3	7	14	3
Hungary	5	7	11	4
Netherlands	12	16	7	1
Poland	8	24	31	4
Finland	30	31	23	7
UK	8	11	13	4

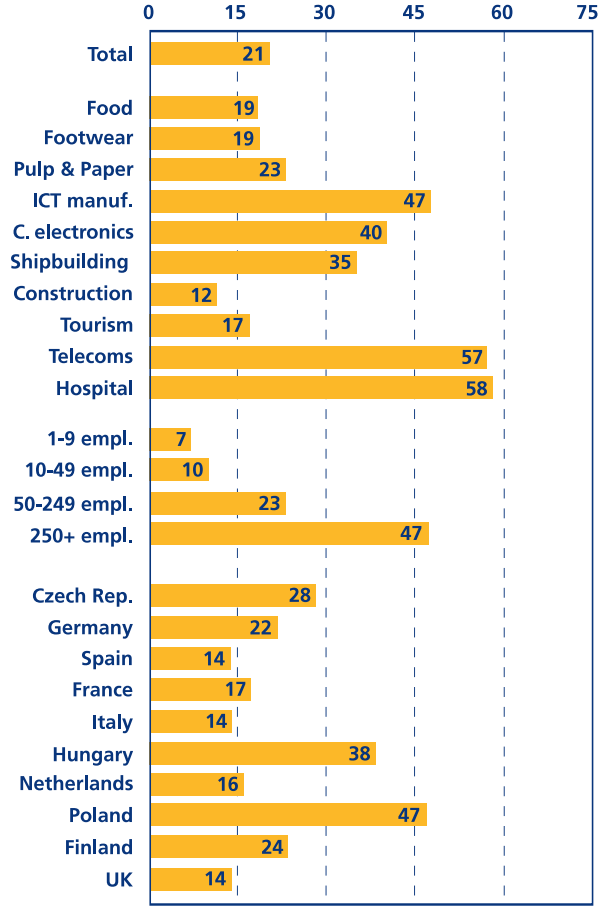
Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey questions: G1: "Please tell us which of the following technical standards your company / hospital uses. Do you use ...?"

Source: *e-Business W@tch* (Survey 2006)

E.2: Companies using Open Source operating systems



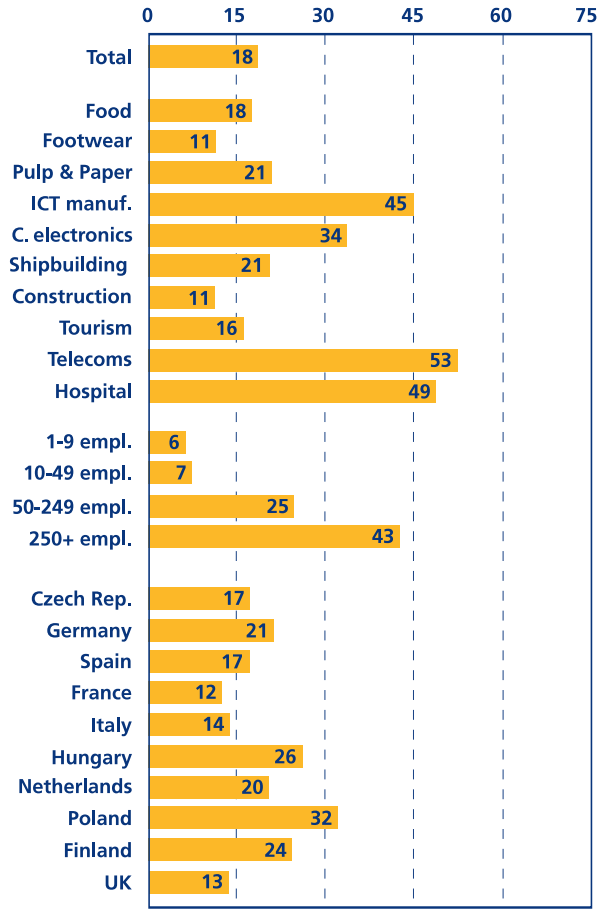
Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: G8a: "Does your company / hospital use Open Source Software? What about Open Source operating systems …?"

Source: *e-Business W@tch* (Survey 2006)

E.3: Companies using Open Source databases



Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

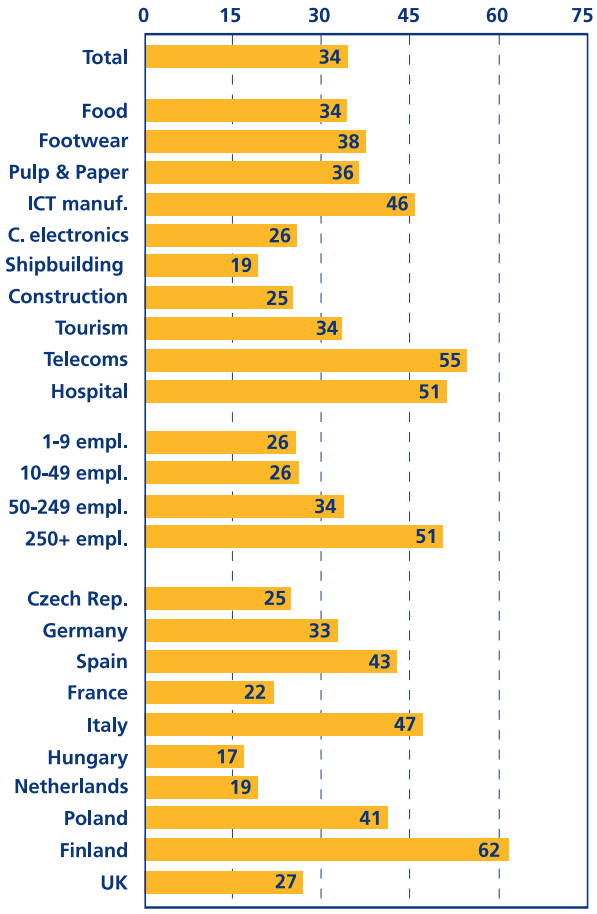
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: G8b: "Does your company / hospital use Open Source Software? What about Open Source databases …?"

Source: *e-Business W@tch* (Survey 2006)

e-Business Indicators 2006:
E. Standards and Interoperability

E.4: Companies saying that interoperability is a critical issue for e-business within their industry



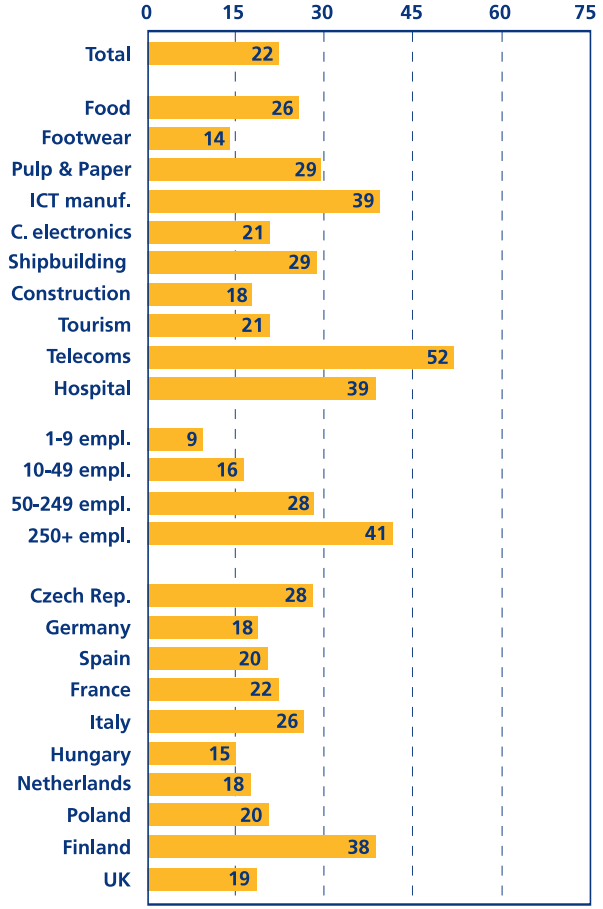
Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: G5a: "Interoperability means that two or more IT systems can exchange data seamlessly. Is interoperability important for e-business with other companies / hospitals or organisations in your industry?"

Source: *e-Business W@tch* (Survey 2006)

F.1: Companies regularly sending employees to ICT training programmes



Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

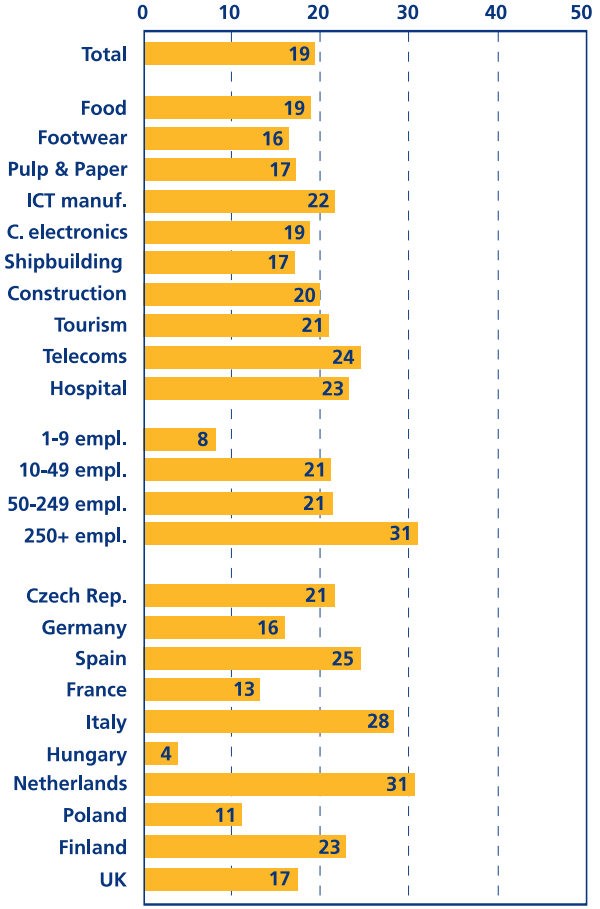
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: B4: "Does your company / hospital regularly send employees to ICT training programmes?"

Source: *e-Business W@tch* (Survey 2006)

e-Business Indicators 2006:
F. ICT Skills and Outsourcing

F.2: Companies having outsourced ICT services in 2005



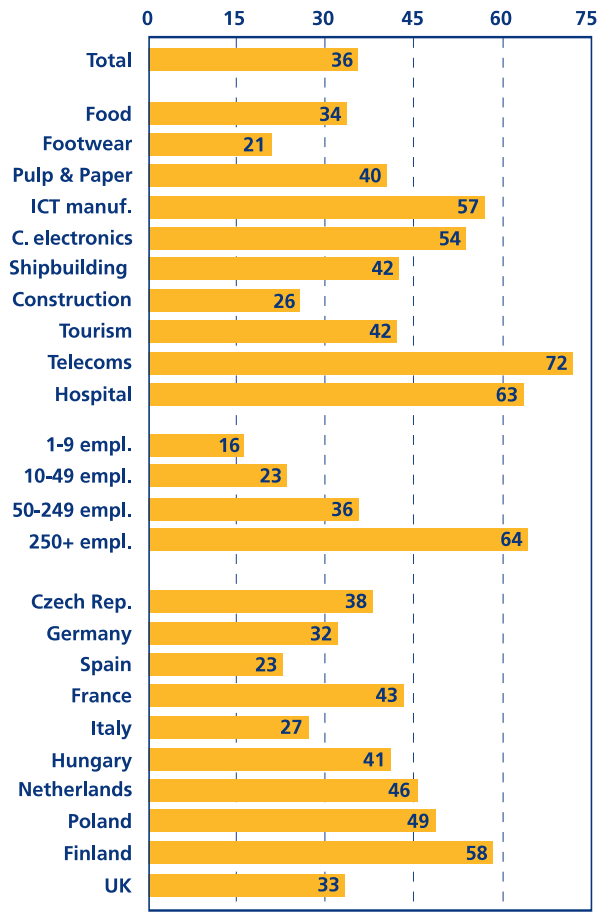
Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: B6: "In the past year, has your company / hospital outsourced any ICT services to external service providers which were previously conducted in-house?"

Source: *e-Business W@tch* (Survey 2006)

G.1: Companies using Secure Server technology



Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

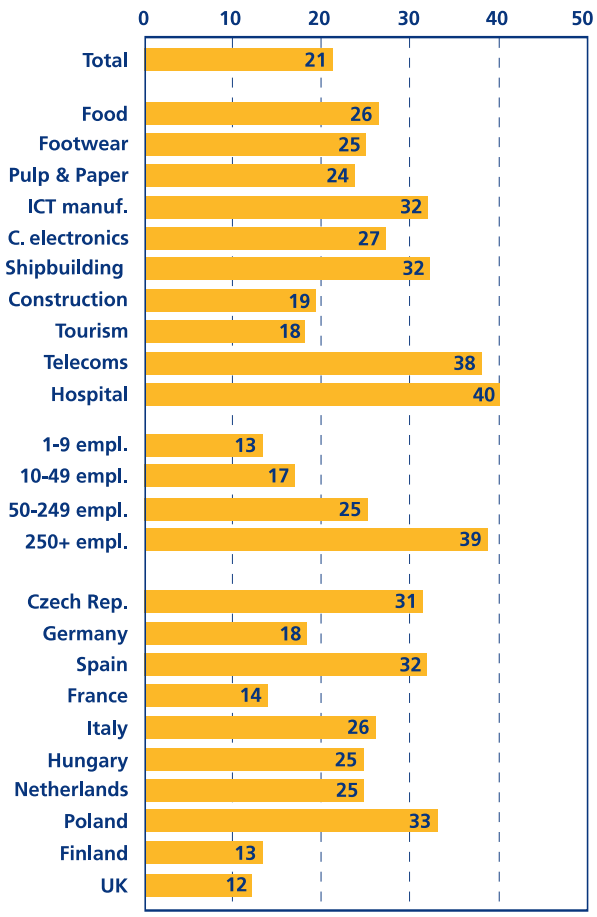
Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: G9a: "Does your company / hospital use secure server technology, for example SSL, TLS or a comparable technical standard?"

Source: *e-Business W@tch* (Survey 2006)

e-Business Indicators 2006:
G. ICT Security

G.2: Companies using Digital Signature/PKI



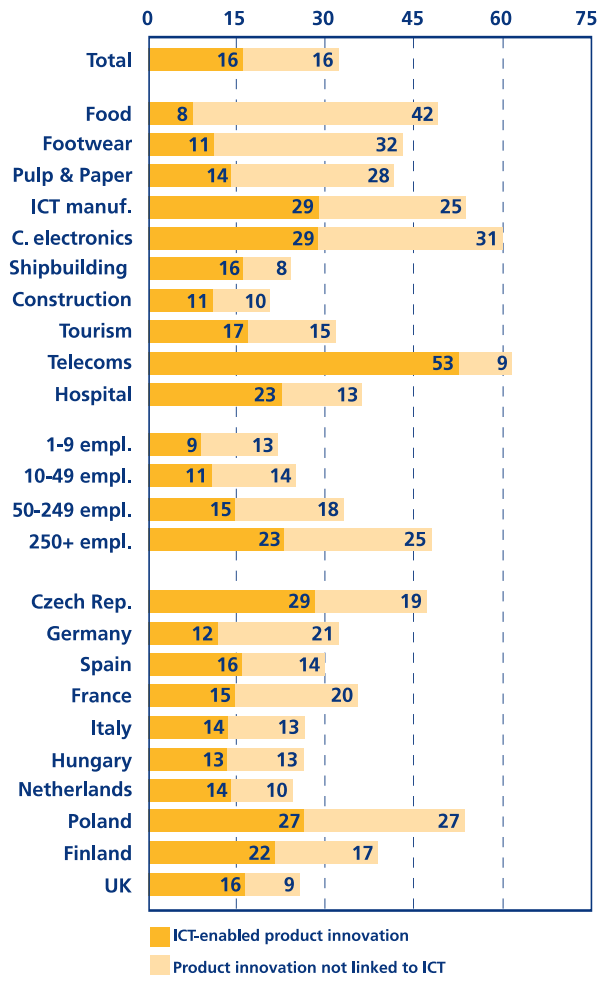
Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: G9b: "Does your company / hospital use digital signature or public key infrastructure?"

Source: *e-Business W@tch* (Survey 2006)

H.1: Companies with product / service innovation in 2005



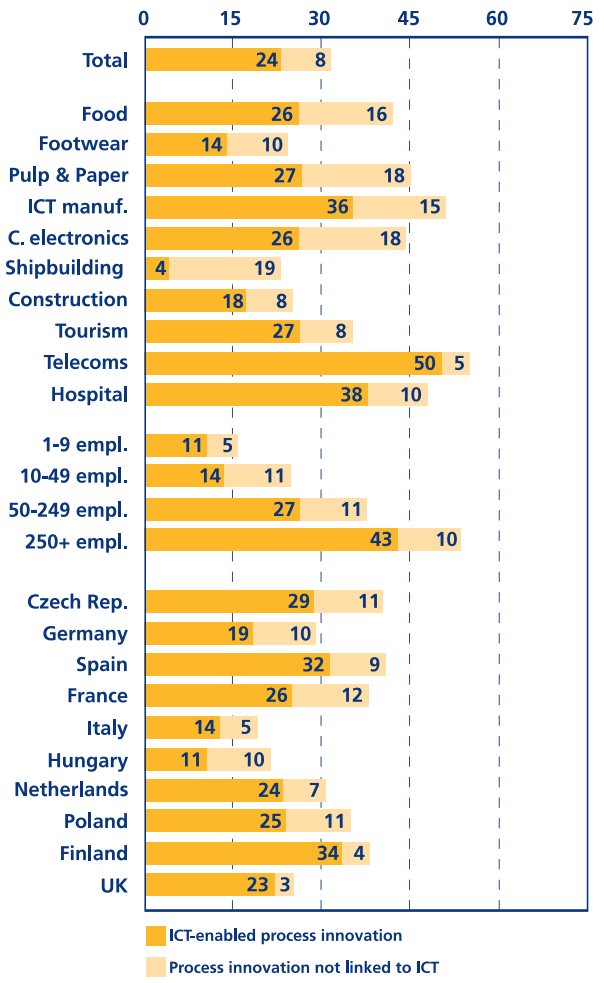
Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey questions: I1: "During the past 12 months, has your company / hospital launched any new or substantially improved products or services?"; I2: "Have any of these product or service innovations been directly related to or enabled by ICT?"

Source: *e-Business W@tch* (Survey 2006)

H.2: Companies with process innovation in 2005



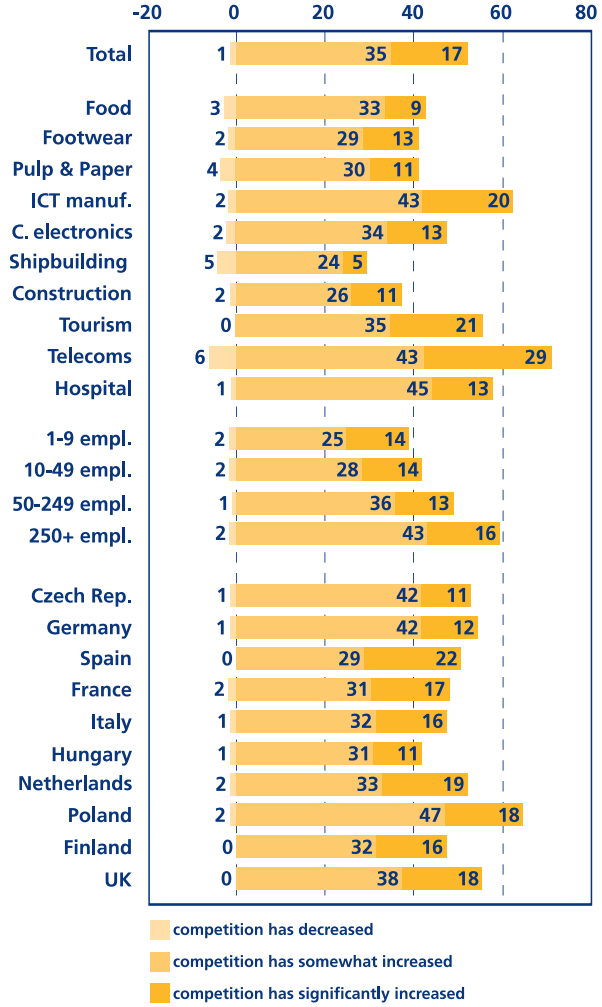
Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey questions: I3: "During the past 12 months, has your company / hospital introduced any new or significantly improved internal processes, for example for producing or supplying goods and services?"; I4: "Have any of these process innovations been directly related to or enabled by ICT?"

Source: *e-Business W@tch* (Survey 2006)

I.1: Companies that observe an ICT impact on competition in their sector



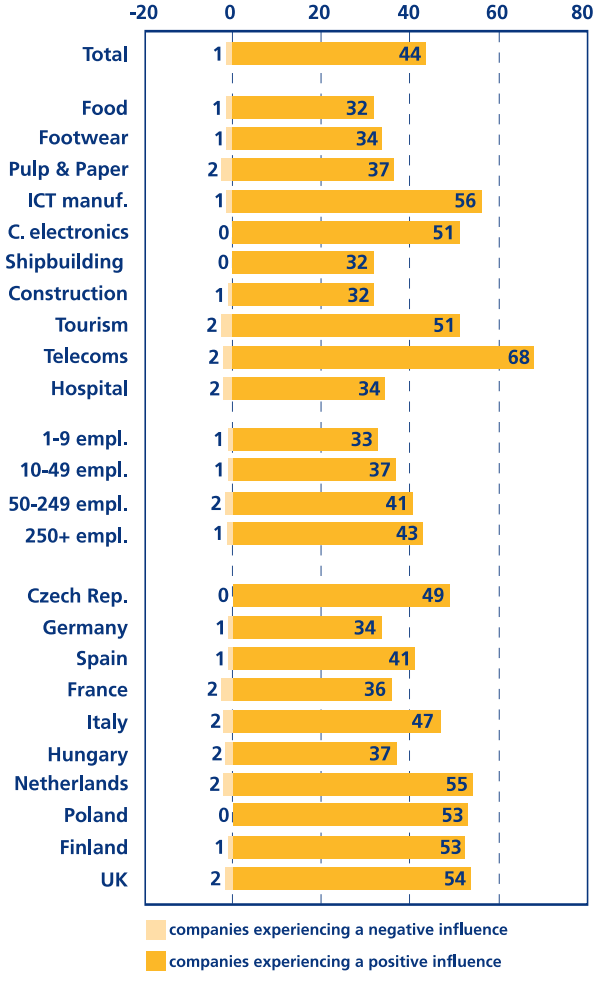
Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK), excluding those saying they "don't know". N=7136 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey questions: H5: "Do you think that ICT has an influence on competition in your sector?"; H6: "To what extent do you think that competition in your sector has increased or decreased due to ICT?"

Source: *e-Business W@tch* (Survey 2006)

I.2: Companies that experience an ICT impact on revenue growth



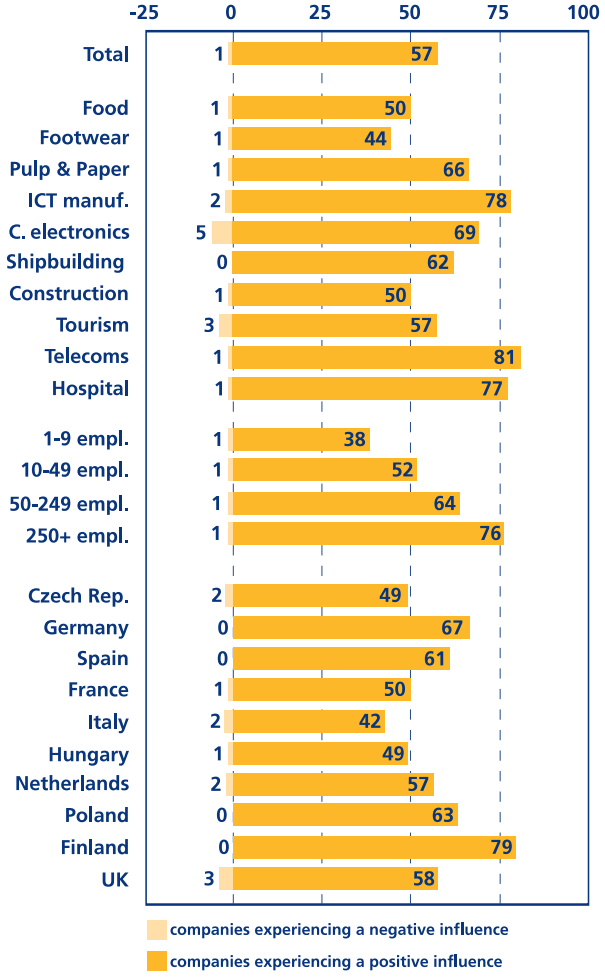
Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: H4a: "All in all, in what ways has ICT influenced the business of your company / hospital? Please tell us … whether ICT has had a positive influence, a negative influence, or no influence at all. Would you say the influence of ICT on revenue growth was …?"

Source: *e-Business W@tch* (Survey 2006)

I.3: Companies that experience an ICT impact on business process efficiency



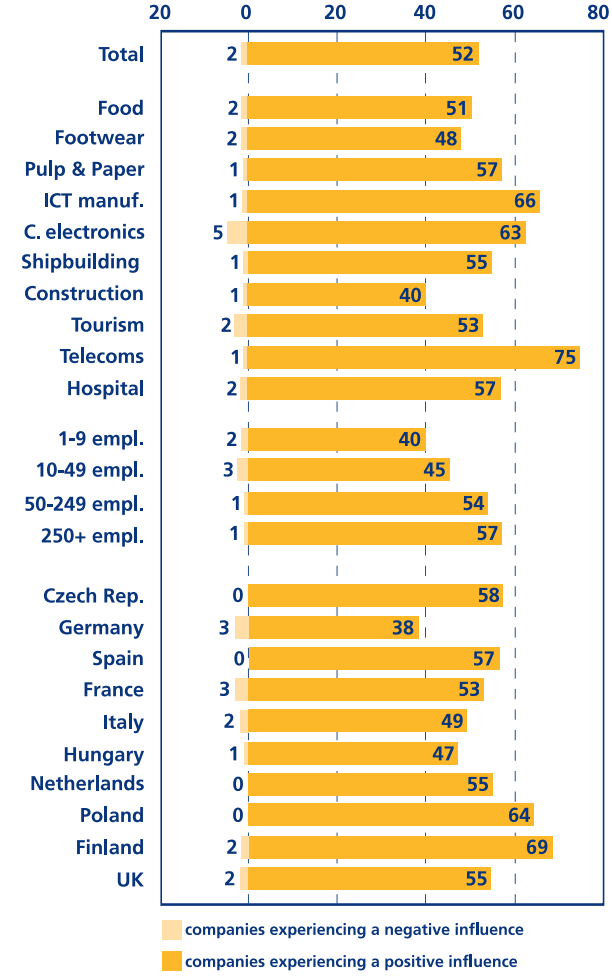
Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: H4b: "All in all, in what ways has ICT influenced the business of your company / hospital? Please tell us … whether ICT has had a positive influence, a negative influence, or no influence at all. Would you say the influence of ICT on the efficiency of business processes was …?"

Source: *e-Business W@tch* (Survey 2006)

I.4: Companies that experience an ICT impact on the quality of customer service



Base: All enterprises that use computers from the 10 sectors covered in the EU-10 (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK). N=7237 (total).

Weighting: Total number, sectors, countries are weighted by employment (= enterprises comprising …% of employment in a sector / country). Figures for size-bands in % of enterprises from the size-band.

Survey question: H4f: "All in all, in what ways has ICT influenced the business of your company / hospital? Please tell us … whether ICT has had a positive influence, a negative influence, or no influence at all. Would you say the influence of ICT on the quality of customer service was …?"

Source: *e-Business W@tch* (Survey 2006)

The e-Business Scoreboard 2006 – Sector Profiles in ICT Use

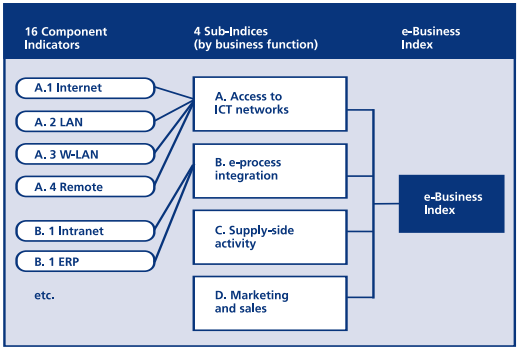
The European e-Business Scoreboard was developed by *e-Business W@tch* in 2004. It is an instrument to compare the intensity of ICT use and e-business activity across different sectors, countries or size-bands in different areas of business activity.

The Scoreboard draws on the Balanced Scorecard approach. It consists of 16 component indicators which are aggregated on two levels, making it possible to benchmark businesses' ICT use from four perspectives:

- First, 16 component indicators are aggregated into *4 sub-indices* (with 4 indicators each) that represent major application areas of e-business.
- Second, the four sub-indices can be aggregated into the *overall e-Business Index*.

The component indicators are mostly taken from those featured in the previous chapter of the pocketbook (categories A-D).

Structure of the e-Business Scoreboard



Methodological notes on the Index

Indexes simplify multi-dimensional concepts. To correctly appreciate the validity and shortcomings of the e-Business Index, the following notes are important:

Weighting: Results are influenced by the selection of the underlying weighting scheme. In the computation presented on this page, employment-weighted figures were used. This emphasises e-business activity in large firms and has an impact on the Index for sectors with dominant large players (for instance the automotive and pharmaceutical industry).

Component indicators: The selection of component indicators may have a bias towards manufacturing activities, as some indicators in dimension B ("internal process") are more relevant for manufacturing than for service sectors (e.g. ERP).

Sector profiles

e-Business in the Food and Beverages Industry

Cost-efficiency and regulation drive the trend toward integration and automation of internal processes in the F&B industry. System integration with suppliers and customers is mostly driven by pressure from the large retail chains, but is hampered by the diversity of systems.

Supply chain management is likely to remain a key point of focus for the leading players in the future: while SCM was previously focused mainly on cost reduction and logistics, today the globalization of supply chain sourcing – driven by cost-reduction policies – combined with safety concerns, adds two important new links in the supply chain: the issues of food supply safety and traceability.

Retail chains continue to drive integration along the supply chain, leveraging their bargaining power towards manufacturers. However, diverse ICT systems, integration costs and the lack of information standards continue to hamper external integration. Many manufacturers and retailers are devoting considerable efforts to integrate their information systems.

RFID is the latest technology that can support traceability and quality assurance in the F&B industry. RFID applications are expanding from quality assurance to efficiency gains and control over inventory, delivery, selling and distribution. Here too, large-scale retailers start requiring the use of tags to improve inventory and to control supply chain management.

However, RFID is still mostly used at the pallet and case level. At unit level, there are still technological constraints to be overcome if it is to be applied a large scale.

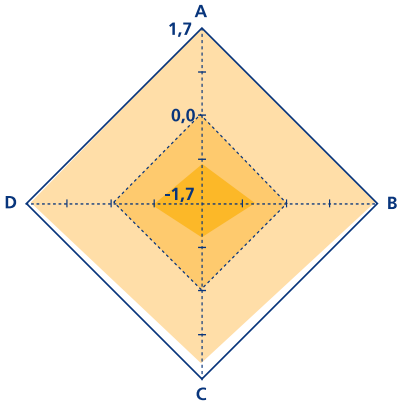
Current ICT trends and emerging technologies:

- Improving internal process automation: digital integration of production-line control, administration, sales and logistics
- Supply chain management to support sourcing in an increasingly global market
- Mobile applications, based on wireless technologies, promise the reduction of data-entry time and errors in sales force work processes
- RFID use, although not yet showing up in figures

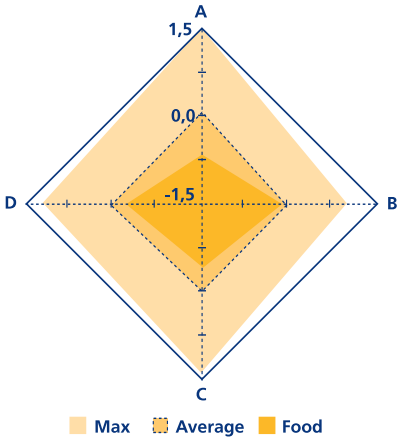
More information on these issues:
Sector Studies at *www.ebusiness-watch.org* ('Resources')

e-Business Scoreboard 2006

based on **data in % of firms**
(emphasises situation in small firms)



based on **employment-weighted data**
(emphasises situation in larger firms)



Max Average Food

e-Business dimensions (sub-indices):
A = Use and access to ICT networks
B = e-Integrated business processes
C = Supply-side e-business activity
D = e-Marketing and Sales

Scale:
Max = maximum ICT / e-business intensity in one of the 10 sectors benchmarked
Average = average ICT / e-business intensity in the 10 sectors benchmarked
Orange diamond = relative e-business intensity in the food industry

Sector profiles

e-Business in the Footwear Industry

The need to manage a complex and diverse organisation of production is the main driver towards the adoption of e-business in the footwear industry. Strategic investments by shoe manufacturers focus on production planning, stock-turn improvement and the reduction of out-of-stocks.

Collaborative work is a key issue among footwear and component manufacturers. The objective is to speed up processes and achieve instant visibility of orders, shipments, and inventory across the supply chain. Companies are challenged to address these issues without expensive solutions or the release of sensitive information to external databases.

The competitive positioning of footwear firms is strongly conditioned by the way they manage and integrate with distribution. Projects for integration between shoe manufacturers and distribution mainly regard the integration of the information and logistic flow along the value chain, linking production to logistics, warehousing and sales. There are successful examples of online integration with proprietary distribution networks.

RFID applications in the footwear industry presently focus on supply chain management, reducing object misplacing and/or theft, enhancing quality control procedures and product tracking, and ensuring the authenticity of objects – representing a protection against counterfeiting.

Diffusion of RFID is still limited. RFID tags are currently attached to warehouse pallets rather than embedded in individual items. At item level, companies are pioneering the use in luxury goods, and in safety and security applications.

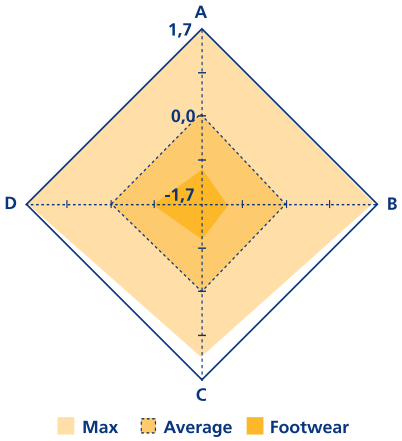
Current ICT trends and emerging technologies:

- ERP and SCM to increase efficiency in production, logistics and marketing & sales
- e-Business standards to support exchange of data and supplier & product certification
- Online orders from customers are already common in the sector but, integration among the information systems of manufacturers and distributors is still scarce. ICT applications in this area could be a driver of overall efficiency.

More information:
Sector Studies at www.ebusiness-watch.org ('Resources')

e-Business Scoreboard 2006

based on **data in % of firms**
(emphasises situation in small firms)



The footwear industry is dominated by small enterprises. A benchmarking with other industries based on employment-weighted data is therefore not recommended for this sector.

e-Business dimensions (sub-indices):
A = Use and access to ICT networks
B = e-Integrated business processes
C = Supply-side e-business activity
D = e-Marketing and Sales

Scale:
Max = maximum ICT / e-business intensity in one of the 10 sectors benchmarked
Average = average ICT / e-business intensity in the 10 sectors benchmarked
Orange diamond = relative e-business intensity in the footwear industry

e-Business in the Pulp and Paper Industry

In the P&P industry, ICT has its main impact as a driver and enabler of process innovation in B2B trading processes and logistics. However, e-business activities and experiences differ widely between large manufacturers and the smaller companies in the sector.

Although the industry as a whole can be characterised as rather conservative, the large companies are quite advanced users of e-business. Requirements for organising trade and logistics on an international scale have been a strong driver to adopt ICT for that purpose. A bottleneck is currently the small installed base of ERP systems among smaller companies, as ERP is the main hub for B2B integration and consequently conducting e-business.

One of the critical success factors for linking ERP systems is agreement on common standards between trading partners. In the P&P industry, papiNet has been successfully established for this purpose. However, even if papiNet is a success by any measure, there is still wide scope for new papiNet implementations, especially those involving SMEs.

RFID is increasingly used for warehouse and inventory management. Early examples of RFID implementation already demonstrate that it can help companies to link ordering, production and logistics processes, and thus to streamline their supply chain and reduce lead times. However, the benefits of RFID over the use of barcode technology for the same purposes are not yet obvious.

On the whole, ICT and e-business have a considerable impact on work processes in individual companies in the sector, but findings do not indicate a comparable impact on the overall industry structure.

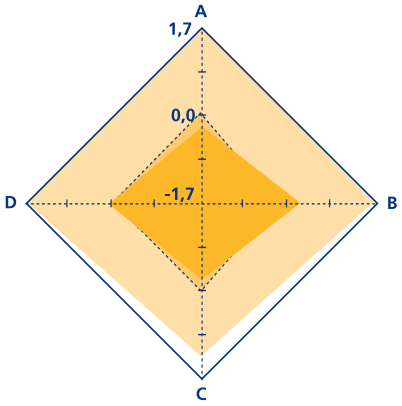
Current ICT trends and emerging technologies:

- ICT as a driver of process efficiency, for example by exchanging order-related data between companies in standardised electronic format
- Deployment of RFID - the P&P industry is among the early adopters of RFID, although it is mainly limited to the large manufacturers
- ICT impact on the demand for paper: substitution of paper-based products, for example in the media industry, could have an impact on paper demand

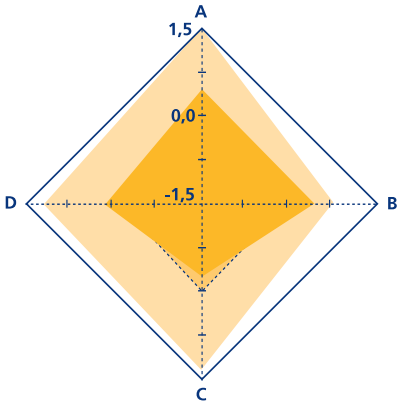
More information:
Sector Studies at www.ebusiness-watch.org ('Resources')

e-Business Scoreboard 2006

based on **data in % of firms**
(emphasises situation in small firms)



based on **employment-weighted data**
(emphasises situation in larger firms)



Max Average Pulp & Paper

The footwear industry is dominated by small enterprises. A benchmarking with other industries based on employment-weighted data is therefore not recommended for this sector.

e-Business dimensions (sub-indices):
A = Basic ICT Infrastructure
B = Internal processes
C = Supply-side e-business activity
D = Electronic marketing and sales

Scale:
Max = maximum e-business intensity in one of the 10 sectors benchmarked
Average = average e-business intensity in the 10 sectors benchmarked
Orange diamond = relative e-business intensity in the pulp and paper industry

Sector profiles

e-Business in the ICT Manufacturing Industry

ICT has had a major impact on relations between companies and on the entire value chain of the ICT industry. By combining new tools with strategy adjustments, most companies benefit from ICT.

The terms of competition in the industry are changed by technological convergence, which forces the companies to expand into new business areas and to integrate business processes. At the same time, companies' success depends on user skills and the provision of complementary products by content providers. However, economic uncertainty hampers investment in new communication technologies.

The deployment of inter-firm computer networks reduces cost of inventory and improves production planning. By spreading the cost and risk of R&D projects, firms can eliminate the problem of duplicated effort and can stimulate innovation. Frequently, large companies initiate the process of supply chain integration, forcing their interests and requirements on business down the value chain. Nevertheless, SME participation in standards setting is necessary to realize the full potential of supply chain integration.

One of the significant impacts of ICT on the PC industry was the adoption of demand-driven production and a standardized organizational structure, which resulted in significant inventory and overhead reduction. This gives companies access to a larger supplier pool and enables them to expand their reach. The main benefit of ICT is reduced need for inventories kept at various stages of the manufacturing process.

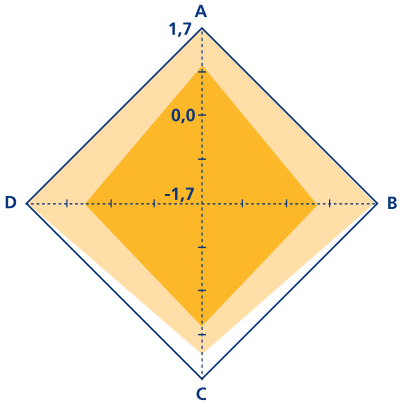
Current ICT trends and emerging technologies:

- Convergence of broadcasting, telephony and computing enabling better integration of services across infrastructures
- Establishing production networks to enhance competitiveness
- Value chain transformation: adoption of modular organizational structures, streamlining information exchange, substitution of inventory and physical activities by information.

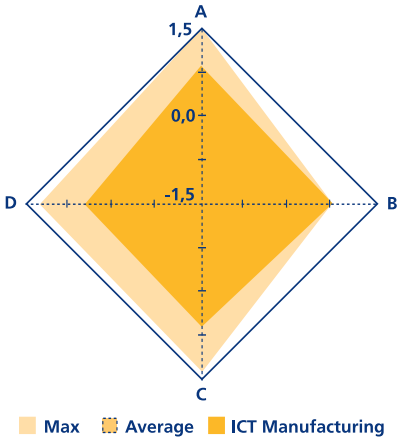
More information:
Sector Studies at www.ebusiness-watch.org ('Resources')

e-Business Scoreboard 2006

based on **data in % of firms**
(emphasises situation in small firms)



based on **employment-weighted data**
(emphasises situation in larger firms)



Max Average ICT Manufacturing

e-Business dimensions (sub-indices):
A = Basic ICT Infrastructure
B = Internal processes
C = Supply-side e-business activity
D = Electronic marketing and sales

Scale:
Max = maximum e-business intensity in one of the 10 sectors benchmarked
Average = average e-business intensity in the 10 sectors benchmarked
Orange diamond = relative e-business intensity in the ICT manufacturing industry

Sector profiles

e-Business in the Consumer Electronics Industry

Globalisation in the consumer electronics (CE) industry is driving the worldwide integration of e-business applications. Digitisation of media content and the fast uptake of broadband internet connections changes the sector's output.

CE companies face serious challenges related to their supply chain activities. Challenges include highly fragmented and global supply chains, short product lifecycles and dependency on key distributors.

ICT and e-business tools can support CE manufacturers to overcome these challenges. However, many companies use these applications less than might be expected. e-Business standards such as EDIFACT, or industry accepted solutions like RosettaNet, provide a solution to automate global supply chain activities. However, it appears that large players are the principal beneficiaries so far.

Digital Rights Management (DRM) and broadband convergence are key issues in this sector, regarding the role of CE companies as suppliers of ICT. Interoperability is a critical success factor for DRM integration, as there are multiple DRM technologies on the market.

Due to increasing availability of broadband connections at reasonable cost and the evolution of broadband services, there is demand for CE devices that support the distribution of content over broadband.

The fast uptake of broadband also provides new opportunities for CE companies by stimulating the demand for networked devices and new web-based services.

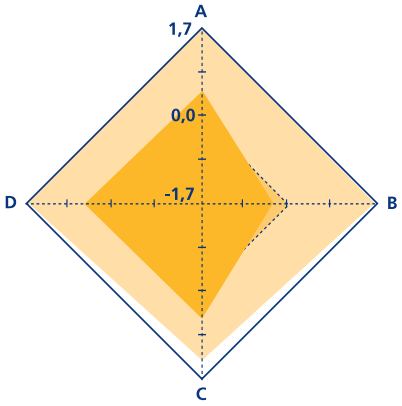
Current ICT trends and emerging technologies:

- ICT supporting a global supply chain: Technologies for supply chain automation, standards and industry-accepted solutions to support e-business integration
- DRM (Digital Rights Management) technologies and, in this regard, interoperability issues are gaining importance
- Increased importance of broadband stimulates the manufacturing of networked CE devices and the provision of Internet-based services

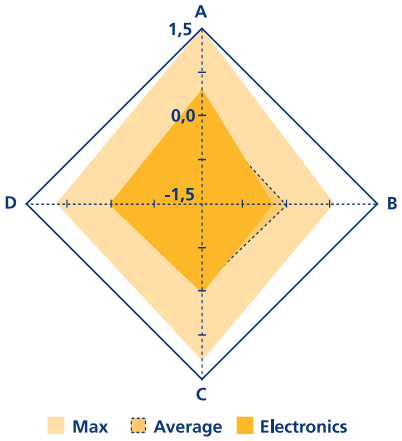
More information:
Sector Studies at www.ebusiness-watch.org ('Resources')

e-Business Scoreboard 2006

based on **data in % of firms**
(emphasises situation in small firms)



based on **employment-weighted data**
(emphasises situation in larger firms)



Max Average Electronics

e-Business dimensions (sub-indices):
A = Basic ICT Infrastructure
B = Internal processes
C = Supply-side e-business activity
D = Electronic marketing and sales

Scale:
Max = maximum e-business intensity in one of the 10 sectors benchmarked
Average = average e-business intensity in the 10 sectors benchmarked
Orange diamond = relative e-business intensity in the consumer electronics industry

e-Business in the Shipbuilding Industry

In the shipbuilding industry, the key application area for ICT is the integration of engineering and production processes along the value chain. This integration has effects on the competitiveness of individual shipyards, as well as on the industry as a whole.

However, there is a clear dichotomy between the large shipyards and the small supply firms. Most of the technologies for collaborative engineering that have been specifically developed for the shipbuilding and repair industry are mainly used by large shipyards.

The picture is different for smaller companies, where implementation costs are a major barrier to e-business initiatives. Furthermore, investments in ICT and e-business and their subsequent implementation require substantial structural, organisational and mentality changes among companies in the industry.

A key driver for the development, implementation and use of ICT and e-business in the industry is the increasing international competition, especially from Asian shipyards. The optimal use of ICT is one of several requirements and possible strategies to improve the competitiveness of enterprises in this context.

Since 2000, some of the major players have launched a variety of e-business initiatives to support B2B trade. However, the characteristics of the shipbuilding industry created significant difficulties for the development of e-procurement. As a result, there is no significant impact of these initiatives observable yet.

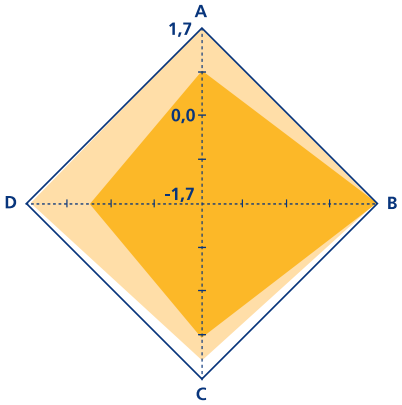
Current ICT trends and emerging technologies:

- Advanced tools for collaborative design, such as three-dimensional CAD, Computer-Aided Manufacturing (CAM) or Computer-Integrated Manufacturing (CIM) – even if so far adopted predominantly only by a few large shipyards.
- Several joint initiatives in setting up B2B trading platforms, but functions are mainly limited to searching for suppliers and requesting quotations.

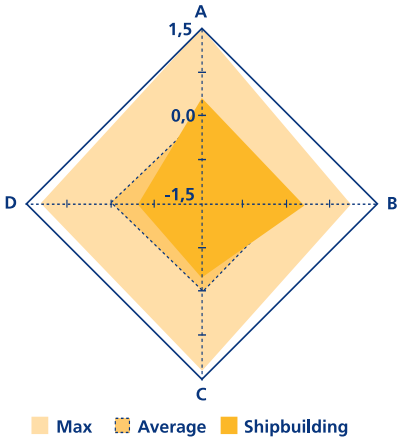
More information:
Sector Studies at www.ebusiness-watch.org ('Resources')

e-Business Scoreboard 2006

based on **data in % of firms**
(emphasises situation in small firms)



based on **employment-weighted data**
(emphasises situation in larger firms)



Max Average Shipbuilding

e-Business dimensions (sub-indices):
A = Basic ICT Infrastructure
B = Internal processes
C = Supply-side e-business activity
D = Electronic marketing and sales

Scale:
Max = maximum e-business intensity in one of the 10 sectors benchmarked
Average = average e-business intensity in the 10 sectors benchmarked
Orange diamond = relative e-business intensity in the shipbuilding industry

e-Business in the Construction Industry

Important developments are taking place in the construction industry – in the areas of e-procurement, project web and 3D. These technologies carry significant economic potential for the industry.

Previously, the construction industry has had a low uptake of ICT, but in recent years the use of advanced ICT tools and systems has increased. The e-Business Survey 2006 shows that large construction enterprises and the public sector drive ICT uptake in the construction industry.

Large firms possess the financial resources, human capital and ICT capabilities which are necessary to benefit most from ICT. The public sector could further accelerate development, both as a major buyer of construction services and via policy initiatives. There is still great potential for further ICT uptake, for example within 3D technology and project webs.

The potential benefits for construction enterprises of implementing ICT include cost reductions, risk minimisation and more precise communication between stakeholders.

Barriers to the uptake of ICT include the strong adherence to traditional work flow processes, lack of skills/capabilities, and incompatibility between different ICT technologies, both internally and externally, due to lack of ICT standardisation.

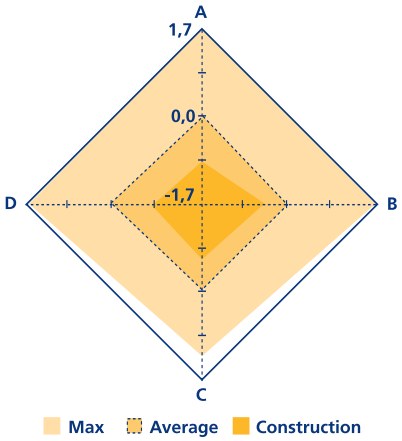
Current ICT trends and emerging technologies:

- e-Procurement driven by the broad introduction of buyer-oriented ICT systems for e-procurement in large construction enterprises.
- 3D technology as a tool for risk/mistake reduction for the construction industry, primarily used by architects and engineering enterprises.
- Project web solutions as enablers of more efficient and secure exchange of information between the stakeholders in construction projects.

More information:
Sector Studies at www.ebusiness-watch.org ('Resources')

e-Business Scoreboard 2006

based on **data in % of firms**
(emphasises situation in small firms)



The construction industry is structurally dominated by a huge number of small enterprises. A benchmarking with other industries based on employment-weighted data is therefore not recommended for this sector.

e-Business dimensions (sub-indices):
A = Basic ICT Infrastructure
B = Internal processes
C = Supply-side e-business activity
D = Electronic marketing and sales

Scale:
Max = maximum e-business intensity in one of the 10 sectors benchmarked
Average = average e-business intensity in the 10 sectors benchmarked
Orange diamond = relative e-business intensity in the construction industry

e-Business in the Tourism Industry

e-Tourism has evolved dynamically over the past 5 years. This has considerable implications for all intermediaries in this industry: dis-intermediation and re-intermediation occur in parallel.

ICT enables service providers in tourism to interact directly with consumers, which puts enormous pressure on traditional intermediaries such as travel agencies and tour operators.

The extent to which intermediaries are bypassed differs considerably between sub-sectors. While, for example, the accommodation sector is only partially affected by dis-intermediation, specific branches of the transport sector, especially the aviation industry, tend to be strongly affected by dis-intermediation.

Yet ICT solutions may also provide new opportunities for traditional players and newly emerging online intermediaries. Many new market entrants who operate exclusively online successfully provide intermediary services, while some bricks and-mortar intermediaries have managed to secure their position in the market by offering value-added online services.

A relatively new trend that has attracted much attention is "dynamic packaging". Traditional packages provided by tour operators and agencies are bundling separate products quite well, but offer limited flexibility for customers. The trend towards individualisation creates demand for more flexible, dynamic packages. Although technological and organisational barriers for truly dynamic packaging are considerable, a number of players are working energetically on the development of feasible solutions for dynamic packaging.

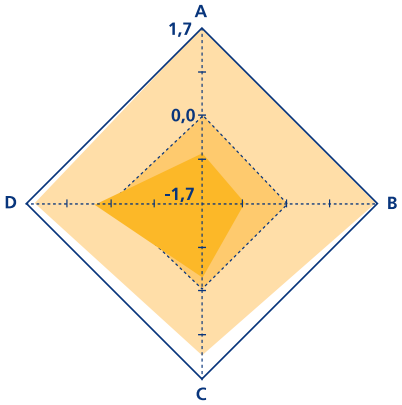
Current ICT trends and emerging technologies:

- e-Ticketing and other innovations in the aviation industry: self-service check-in kiosks, the possibility to check-in via the internet, bar-coded boarding passes and the possible introduction of RFID technology for luggage handling.
- Dynamic packaging, where different travel components are bundled at a single contact point of sale; each selection made by the consumer shapes the response of the packaging system and the final price.

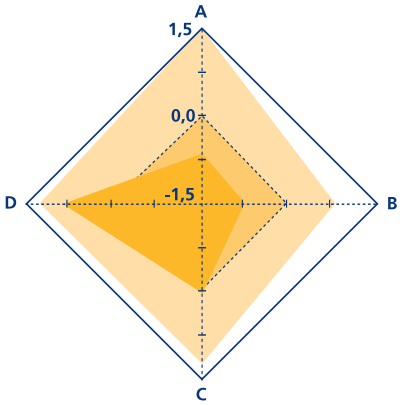
More information:
Sector Studies at www.ebusiness-watch.org ('Resources')

e-Business Scoreboard 2006

based on **data in % of firms**
(emphasises situation in small firms)



based on **employment-weighted data**
(emphasises situation in larger firms)



Max Average Tourism

e-Business dimensions (sub-indices):
A = Basic ICT Infrastructure
B = Internal processes
C = Supply-side e-business activity
D = Electronic marketing and sales

Scale:
Max = maximum e-business intensity in one of the 10 sectors benchmarked
Average = average e-business intensity in the 10 sectors benchmarked
Orange diamond = relative e-business intensity in the tourism industry

Sector profiles

e-Business in the Telecommunication Services Industry

The market environment for companies in the liberalised telecommunications (telco) industry has become extremely competitive. Cost pressure is increasing. Players are reacting by developing new services, streamlining processes and efficiently managing customer relationships.

As providers of ICT services, companies in this sector are already familiar with the benefits of ICT and e-business technologies as well as with strategies for their integration. As a consequence, adoption and use of nearly all major e-business applications are clearly above the average of the 10 sectors studied.

In particular, the telco industry sets standards for the use of ICT in marketing, sales and customer care. Even small companies use e-business tools for this purpose in a way that could serve as role model for activities by SMEs in other industries.

Telco companies are important for other industries as suppliers of ICT services. In this context, the convergence of platforms and technologies has a significant impact on the sector's output, on competition and on growth.

The key technical trend that currently drives convergence is the "IP transformation" of traditional services, for example the delivery of Voice over Internet Protocol (VoIP) and the provision of TV services via IP-based networks (IPTV). Mobile substitution is a further driver of convergence, i.e. the delivery of conventional fixed-line services over mobile networks.

For telco companies, the convergence of ICT-based services opens new opportunities to use e-business for the provision of new services, as well as for automation of internal processes (e.g. billing platforms).

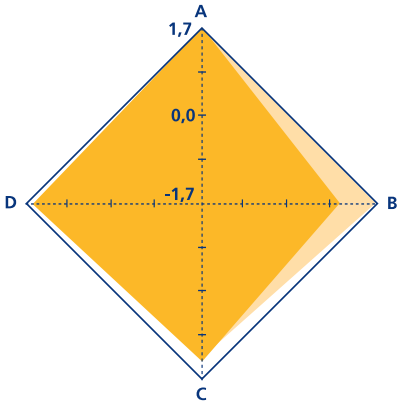
Current ICT trends and emerging technologies:

- Supporting marketing, sales and customer care: CRM systems for mass data processing, innovative web-based customer services
- Convergence driving technologies, including Voice- over-IP, new broadband access technologies and IPTV
- ICT to improve internal process automation and the provision of new services, e.g. converged platforms for service provision and billing

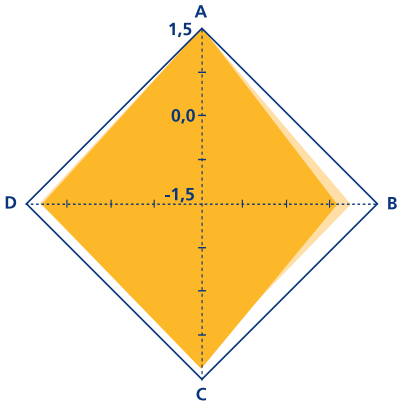
More information:
Sector Studies at www.ebusiness-watch.org ('Resources')

e-Business Scoreboard 2006

based on **data in % of firms**
(emphasises situation in small firms)



based on **employment-weighted data**
(emphasises situation in larger firms)



Max Average Telecom

e-Business dimensions (sub-indices):
A = Basic ICT Infrastructure
B = Internal processes
C = Supply-side e-business activity
D = Electronic marketing and sales

Scale:
Max = maximum e-business intensity in one of the 10 sectors benchmarked
Average = average e-business intensity in the 10 sectors benchmarked
Orange diamond = relative e-business intensity in the telecommunications industry

Sector profiles

ICT use in the Hospital Sector

Almost all European hospitals have at least an electronic system for patient data and financial administration. However, only few of them use more sophisticated systems, and departmental information systems are often not integrated with each other.

Core drivers of e-business implementation in hospitals include cost containment, improvement of the quality of health care, and state regulations, for example the implementation of Diagnosis-Related Groups. On the other hand, possible barriers to ICT investment include management deficiencies, a lack of interoperable and widely-used standards, and security challenges.

The role of acute care hospitals is to provide in-house, comprehensive, specific and round-the-clock care. With increasing investment in ICT, the role of hospitals may change. ICT impacts mainly on the need for in-house care: telemedicine applications may make it possible to monitor patients' vital data at home, and electronic communication between hospitals and general practitioners may make a patient's visit to the hospital unnecessary.

Hospital Information Systems can help to cope with the huge amount of data a hospital has to deal with, they can enhance communication among professionals and bring useful knowledge to them, and they can make processes more efficient. However, often these systems are not integrated with each other inside the hospital. The main reason may be managerial shortcomings in hospitals, related to an often fragmented organisation and insufficient strategic ICT planning.

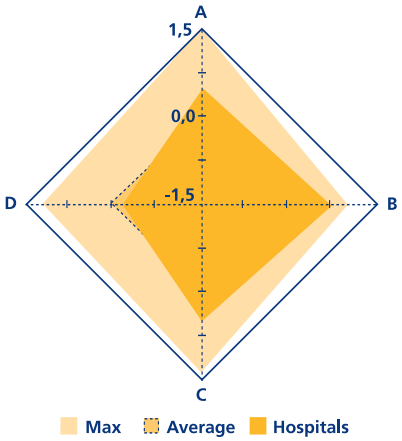
Current ICT trends and emerging technologies:

- Electronic medication management through computerised physician order entry can significantly reduce medical errors and save lives.
- Electronic patient record systems and web services are two means of improving continuity of health care that are currently on the agenda of many hospitals.
- As unauthorised access to electronic patient records is a core problem, identification and authentication of users is a core issue of ICT security in hospitals.

More information:
Sector Studies at www.ebusiness-watch.org ('Resources')

e-Business Scoreboard 2006

based on **employment-weighted data**
(emphasises situation in larger firms)



In the hospital sector, there are hardly any micro or small organisations. A benchmarking with other sectors based on data in "% of firms" is not recommended, as many of the other sectors are structurally dominated by small companies. Thus there is no common base for a comparison.

e-Business dimensions (sub-indices):
A = Basic ICT Infrastructure
B = Internal processes
C = Supply-side e-business activity
D = Electronic marketing and sales

Scale:
Max = maximum e-business intensity in one of the 10 sectors benchmarked
Average = average e-business intensity in the 10 sectors benchmarked
Orange diamond = relative e-business intensity in the hospitals sector

e-Business Adoption by Country

This chapter shows some of the survey results for those 19 countries which are not part of the EU-10 as presented in chapter 1 (p. 13f.).

As the sector configuration in these countries was different in the survey, country comparisons can only be made on a sector basis, but not in the aggregate of sectors. The following tables show the results for food and beverages, ICT manufacturing, construction, tourism and telecommunications. Six indicators have been selected as relevant examples (in brackets: reference to indicator no. in chapter 1):

1. Companies with broadband internet access (A-1)

2. Companies using an ERP system (B-2)

3. Companies placing orders to suppliers online (C-1)

4. Companies having linked their ICT system with suppliers (C-3)

5. Companies using a CRM system (D-1)

6. Companies receiving orders from customers online (D-2)

Readers are advised that these country data (for single sectors) are only indicative and should be used very cautiously, mainly for the following reasons:

a) The number of observations (N) within single sector-country cells is small (normally 50-150); statistical confidence intervals tend to be quite high.

b) Countries differ in their industry structure (within sectors); if small firms dominate a national industry (and, thus, survey results), figures for ICT adoption are likely to be lower.

c) Some factors which cannot be controlled may have a strong impact on the survey outcome, e.g. higher non-response rates (interview refusals) among large companies in some countries than in others, some differences in business directories from which samples are drawn.

1. Companies with broadband internet access (%)

	Food	ICT manuf.	Tourism	Construction	Telecom
Belgium	86	73		87	80
Denmark	85		85	82	86
Estonia			89	75	89
Greece	54		60	54	
Ireland	95	99	63	52	
Cyprus	50		54	55	
Latvia		74	63	71	80
Lithuania		78		79	89
Luxembourg			69	78	
Malta			77	77	
Austria	68		66	69	
Portugal	77		80		
Slovenia	47		70	70	
Slovakia			63	66	70
Sweden		97	88		90
Bulgaria	79		53	61	
Romania	47		63	50	81
Turkey		73			74
Norway			89	92	
EU-10	**72**	**84**	**72**	**72**	**88**

Base: All enterprises that use computers.
N ~ 50-150 per country-sector-cell (depending on country)
EU-10 (for comparison) include CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK.

Weighting: by employment (= enterprises comprising …% of employment in a country).

Survey questions: "A1: Does your company have access to the internet?"
A3: "Which technology does your company use to connect to the internet?"

Source: *e-Business W@tch* (Survey 2006)

2. Companies using an ERP system (%)

	Food	ICT manuf.	Tourism	Construction	Telecom
Belgium	35	85		20	41
Denmark	50		23	21	74
Estonia			6	13	11
Greece	49		31	26	
Ireland	41	59	5	7	
Cyprus	38		13	23	
Latvia		41	11	11	27
Lithuania		27		20	23
Luxembourg			23	27	
Malta			21	8	
Austria	27		16	26	
Portugal	23		28		
Slovenia			10	13	
Slovakia			7	11	20
Sweden		33	8		19
Bulgaria	30		22	17	
Norway			17	29	
EU-10	**32**	**61**	**15**	**18**	**32**

Base: All enterprises that use computers.
N ~ 50-150 per country-sector-cell (depending on country)
EU-10 (for comparison) include CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK.

Weighting: by employment (= enterprises comprising …% of employment in a country).

Survey question: D1d: "Does your company use … an ERP system, that is Enterprise Resource Planning System?"

Source: *e-Business W@tch* (Survey 2006)

3. Companies placing orders to suppliers online (%)

	Food	ICT manuf.	Tourism	Construction	Telecom
Belgium	57	70		48	87
Denmark	83		77	87	99
Estonia			73	63	67
Greece	54		45	43	
Ireland	52	71	55	45	
Cyprus	33		52	36	
Latvia		62	35	52	53
Lithuania		60		49	70
Luxembourg			57	53	
Malta			53	62	
Austria	61		72	68	
Portugal	30		29		
Slovenia			43	36	
Slovakia			36	34	40
Sweden		91	81		81
Bulgaria	38		21	40	
Romania	44		51	48	71
Turkey		70			63
Norway			85	74	
EU-10	**54**	**72**	**60**	**53**	**78**

Base: All enterprises that use computers.
N ~ 50-150 per country-sector-cell (depending on country)
EU-10 (for comparison) include CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK.

Weighting: by employment (= enterprises comprising …% of employment in a country).

Survey question: E1: "Does your company use the internet or other computer-mediated networks to place orders for goods or services online?"

Source: *e-Business W@tch* (Survey 2006)

4. Companies having linked their ICT system with suppliers (%)

	Food	ICT manuf.	Tourism	Construction	Telecom
Belgium	4	17		11	41
Denmark	32		24	14	28
Estonia			10	3	
Greece	9		13	8	
Ireland	24	39	13	2	
Cyprus	2		23	5	
Latvia		19	10	2	14
Lithuania		13		3	19
Luxembourg			12	10	
Malta			18	2	
Austria	15		16	19	
Portugal	3		8		
Slovenia			7	3	
Slovakia			11	9	20
Sweden		16	12		13
Bulgaria	11		7	7	
Romania	13			12	
Turkey					
Norway			24	24	
EU-10	**14**	**16**	**14**	**8**	**20**

Base: All enterprises that use computers.
N ~ 50-150 per country-sector-cell (depending on country)
EU-10 (for comparison) include CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK.

Weighting: by employment (= enterprises comprising …% of employment in a country).

Survey question: F13a: "Is your company's ICT system linked to the ICT system of suppliers?"

Source: *e-Business W@tch* (Survey 2006)

5. Companies using a CRM system (%)

	Food	ICT manuf.	Tourism	Construction	Telecom
Belgium	20	50		15	37
Denmark	23		24	17	80
Estonia			15	5	22
Greece	15		25	3	
Ireland	30	49	12	6	
Cyprus	5		31	25	
Latvia		24	4	4	22
Lithuania		14			23
Luxembourg			20	12	
Malta			21	10	
Austria	20		27	15	
Portugal	6		15		
Slovenia			5	7	
Slovakia			6	11	20
Sweden		27	16		42
Bulgaria	7		17	5	
Romania	14		27	7	20
Turkey		33			26
Norway			49	26	
EU-10	**14**	**31**	**23**	**9**	**48**

Base: All enterprises that use computers.
N ~ 50-150 per country-sector-cell (depending on country)
EU-10 (for comparison) include CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK.

Weighting: by employment (= enterprises comprising …% of employment in a country).

Survey question: F2: "Does your company use a CRM system, that is a specific software suite for customer relationship management?"

Source: *e-Business W@tch* (Survey 2006)

6. Companies receiving orders from customers online (%)

	Food	ICT manuf.	Tourism	Construction	Telecom
Belgium	22	25		9	45
Denmark	31		57	19	80
Estonia			69	34	43
Greece	23		35	5	
Ireland	32	49	47	7	
Cyprus	3		41	13	
Latvia		25	33	7	36
Lithuania		18		19	54
Luxembourg			65	6	
Malta			61	15	
Austria	28		65	15	
Portugal	12		35		
Slovenia			52	12	
Slovakia			36	21	30
Sweden		19	44		48
Bulgaria	23		28	27	
Romania	26		53	25	38
Turkey		31			36
Norway			62	20	
EU-10	**31**	**26**	**49**	**13**	**36**

Base: All enterprises that use computers.
N ~ 50-150 per country-sector-cell (depending on country)
EU-10 (for comparison) include CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK.

Weighting: by employment (= enterprises comprising …% of employment in a country).

Survey question: F4: "Does your company allow customers to order goods or to book services online from the website or through other computer-mediated networks?"

Source: *e-Business W@tch* (Survey 2006)

Methodological Notes: The e-Business Survey 2006

Data presented in this pocketbook result from of a representative survey among decision-makers in European enterprises from 29 European countries. It was the fourth survey by e-Business W@tch, following those of 2002, 2003 and 2005.

The e-Business Survey 2006 consisted of 14,081 telephone interviews with decision-makers in enterprises from 29 countries, including all EU Member States as well as EEA and Candidate Countries. In 10 countries ("EU-10"), all 10 sectors were covered; in the other countries, selected industries were surveyed. In most countries, between 400 and 750 interviews were conducted. The survey fieldwork was coordinated by Ipsos Germany.

Interviews were carried out in March and April 2006, using computer-aided telephone interview (CATI) technology. The decision-maker in the enterprise targeted by the survey was normally the person responsible for ICT within the company, typically the IT manager. Alternatively, particularly in small enterprises without a separate IT unit, the managing director or owner was interviewed.

Population coverage and sampling

As in 2005, the survey included only companies that used computers. Thus, the highest level of the population was the set of all computer-using enterprises which were active within the national territory of one of the 29 countries covered, and which had their primary business activity in one of the 10 sectors specified on the basis of NACE Rev. 1.1.

The survey was carried out as an enterprise survey, i.e. with a data collection and reporting focus on the enterprise, defined as a business organisation (of one or more establishments) comprising of one legal unit.

The sample drawn was a random sample of companies from the respective sector population in each country where the respective sector was to be surveyed, with the objective of fulfilling strata with respect to company size class. Strata were to include a share of at least 10% of large companies (250+ employees) per country-sector cell, 30% of medium sized enterprises (50-249 employees) and 25% of small enterprises (10-49 employees). Samples were drawn locally by fieldwork organisations based on recognised business directories and databases.

Due to the rather small population of enterprises in some of the sectors, target quota, particularly in the larger enterprise size-bands, could not be accomplished in each of the countries. In these cases, interviews were shifted to the next largest size-band or to other sectors.

Sectors covered by the e-Business Survey 2006

NACE Rev. 1.1	Sector name	No. of firms in EU-25*	No. of interviews
DA 15 (most groups)	Food and beverages	282,000	1,709
DC 19.3	Footwear	13,700	980
DE 21	Pulp, paper and paper products	18,400	1,158
DL 30, 32.1+2	ICT manufacturing	31,800	1,687
DL 32.3	Consumer electronics	5,400	665
DM 35.11	Shipbuilding and repair	7,200	150
F 45.2+3 (most classes)	Construction	1,546,000	2,655
H 55.1/3; I 63.3; O 92.33/52	Tourism	1,500,000	2,663
I 64.2	Telecommunication services	12,900	1,580
N 85.11	Hospital activities	(e) 18,000	834

(*) mostly based on Eurostat SBS (latest available figures); (e) = estimate

Survey modules – indicators

Interviews with companies included questions on the following areas of ICT use and electronic business activity:

- ICT networks
- e-Skills development and outsourcing of ICT services
- Investment in ICT and security issues
- ICT-based internal and external e-collaboration
- Supplier-facing e-business activity: e-sourcing and e-procurement
- Customer-facing e-business activity: e-marketing and e-sales
- Use of e-standards and interoperability issues
- ICT impact, drivers and inhibitors
- Background information about the company (basic company data, innovation activity)

Tabulations – the "EU-10"

Most of the tables in this Pocketbook feature a breakdown of the population of enterprises based on the aggregate of 10 EU countries (CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK), as in these countries all 10 sectors were included in the survey and therefore comparability of the sample is given. These 10 countries represent more than 80% of the total GDP and inhabitants of the EU-25 and are thus to a large extent representative for the whole EU.

Users of the data should bear in mind that the configuration of the survey set-up reflects the mandate of *e-Business W@tch* to focus on sectors and SMEs. As a result, comparisons should mainly be made between industries and size-bands of enterprises. Breakdowns by country should be treated more cautiously. The number of observations within many sector-country cells is relatively small, and industry structure (within a sector, and across sectors within a country) can have a critical impact on results.

Non response

In a voluntary telephone survey, in order to achieve the targeted interview totals, it is always necessary to contact more companies than just the number equal to the target. In addition to refusals, or eligible respondents being unavailable, any sample contains a proportion of "wrong" businesses (e.g., from another sector), and wrong and/or unobtainable telephone numbers. The completion rate (= the number of completed interviews divided by the net sample of contacts established with eligible enterprises / hospitals) was typically about 15-20%, with, however, big differences in some of the countries.

Statistical accuracy of the survey

Statistics vary in their accuracy, depending on the kind of data and sources. A 'confidence interval' is a measure that helps to assess the accuracy that can be expected from data. The confidence interval is the estimated range of values on a certain level of significance.

In this survey, for totals of all 10 sectors (in the EU-10), an accuracy of about +/- 3 percentage points can be expected for most values that are expressed as "% of firms", and of about +/- 2 percentage points for values that are weighted by employment. The confidence intervals for industry totals (EU-10) differ considerably depending on the industry and the respective value; on average, it is about +/- 5 percentage points (in both weighting schemes). Differences lying within these intervals should not be emphasised.

Confidence intervals are highest for the shipbuilding and repair industry, due to the small number of observations. Data for this industry are therefore indicative and cannot claim to have statistical accuracy.

Weighting principles

Two weighting schemes have been applied: weighting by employment and weighting by the number of enterprises. The respective weightings are used depending on the context and objective of the analysis.

- Values that are reported as weighted by employment should be read as "enterprises comprising x% of employees". The reason for using employment weighting is that there are many more micro and small enterprises than others. Unweighted figures would therefore effectively represent mainly the smallest sizes of firm.

- Values that are reported as enterprise-weighted figures are to be read as "x% of enterprises", reflecting the number of enterprises as legal entities but not their relative economic importance in terms of employment.

Weighting was based on the latest available universe figures by Eurostat (mostly from the Structural Business Statistics) and on business directories. Missing or undisclosed universe data were computed depending on auxiliary or proxy data. The weighting cells correspond to the data reporting pattern used with regard to industries and employment size-classes. Uniform expansion factors were applied to enterprises within one of the four size-classes per industry per country. In terms of data that refer to a base other than the universe of all enterprises (e.g. indicators appropriately reported for online selling enterprises only), expansion factors were adjusted to the different shares of observations per cell that build the computation base.

Further background information

More information about the methodology, the full questionnaire, and lists of the fieldwork organisations that carried out the survey in the various countries, and the directories used for sampling, can be downloaded from the *e-Business W@tch* website:

www.ebusiness-watch.org

Methodological notes

Component Indicators of the e-Business Scoreboard

Conceptually, the e-Business Scoreboard owes a debt to the Balanced Scorecard (BSC) approach, which suggests that an organisation should be viewed from four perspectives, and that metrics (and targets) are to be defined for each perspective. Similarly, the e-Business Scoreboard looks at ICT use by enterprises from four (inter-related) perspectives. Component indicators represent the metrics for these perspectives:

A. Use of ICT networks

A-1 Internet connectivity (covers internet access + bandwidth)
A-2 Use of a LAN
A-3 Use of a Wireless LAN
A-4 Remote access to the company's computer network

B. e-Integration of Internal Business Processes

B-1 Use of an intranet
B-2 Use of an ERP (Enterprise Resource Planning) system
B-3 Companies tracking production time / working hours online
B-4 Companies sending or receiving e-invoices

C. e-Procurement and Supply Chain Integration

C-1 Companies placing >5% of their orders to suppliers online
C-2 Companies using specific ICT solutions to support sourcing and procurement processes
C-3 Companies linking their ICT system with suppliers
C-4 Online management of capacity / inventory

D. e-Marketing and Sales

D-1 Use of a CRM (Customer Relationship Management) system
D-2 Companies receiving >5% of orders from customers online
D-3 Companies using specific ICT solutions to support marketing and sales processes
D-4 Companies linking their ICT system with customers

Notes: